The Builder.

VOL. XLIV. No. 2108. SATURDAY, JUNE 30, 1883.

ILLUSTRATIONS.

Châlet Residence, Harrow Park (Double-page Engraving).—Mr. J. T. Walford, Architect 882
Lodge to Great Ayton-in-Cleveland Cemetery.—Mr. John W. Alexander, Architect 884
Artisans', Labourers', and General Dwellings Estate at Hornsey (Plans, 891).—Mr. Rowland Plumbe, Architect 886
A Room of the Oriental Museum, Vienna (Double-page Engraving) 888, 889
Plan of Artisans', Labourers', and General Dwellings Estate at Hornsey 893

CONTENTS.

On Art as Decorative and Decorative Art 869
The Safety of Egress from Public Buildings 870
The Irish Lace Exhibition 871
In and About Hampstead-road: St. James's Burial-Ground 872
Passages in an Unsuccessful Career: My First Building 873
Cafés and Coffee-houses 873
The Picturesque in Cement 874
Modern Hospital Construction: By E. C. Robins, F.S.A. 875
New Facts as to the Cost of Inland Transport 879
The Imperial Palace at Strasburg 879
Mr. W. J. Worthington, Architect 879
The Dangers of Overhead Wires 879
Victor Emanuel Competition 879
Châlet Residences: Harrow-on-the-Hill 879
Great Ayton Cemetery Lodge 879
The Artisans' Estate at Hornsey 880
The Oriental Museum, Vienna 880
The Site for the Proposed Cathedral for Liverpool 897
Silos and Ensilage 897
Berks Archæological and Architectural Society 898
Birmingham Archæologists at Oxford 898
Proposed Sailors' Home at Leith 898
Examinations at the Surveyors' Institution 899
Children's Hospital for Birkenhead 900
New Buildings in George-street, Edinburgh 901
Building Patent Record 901
Surveyorship Items 901
Stained Glass 901
Improved Air-Warming and Cooling Apparatus 902
Awards at the National Health Society's Exhibition 902
Competitions 902
Metropolitan Building Act.—What is a Building? 903
Goole Sewerage Works 903
The Royal Courts of Justice: Contractors' Claim for "Retention Money" 903
A Dirty Slaughter-house: Public Abattoir Wanted 904
The Sunderland Catastrophe 904
Sliding Doors for Buildings and Railways 904
The Cost of Getting your Own 904
Masters and Men 904
Provincial News 904
Church-building News 905
Dissenting Church-building News 905
Books: Turner's Hints to House-hunters and House-holders (Batsford) 905
Variorum 906
The Ventilation of the District Railway 906
Miscellanea 906

On Art as Decorative and Decorative Art.

IT is a not unfrequent ground of complaint against those who are most eager to communicate their appreciation of works of art, that the terms which they habitually employ are sometimes too vague to fix any meaning whatever, and sometimes so equivocal as to cover only too many meanings. At the present time the occasion seems to have become pressing in the interest of simplicity and precision, to secure an understanding as to the consistent acceptation in the criticism of art of the word "decorative." It recurs now so frequently that it is quite worth while to hold it fast, if we can, to a definite limitation of characteristics.

All fine art is decorative, in a very decided sense, and, indeed, it claims to be art at all in virtue of being decorative; its end and aim, its purpose and pretension, is beauty; and what beauty is that which does not embellish? The very highest art may therefore, in a certain sense, be honourably and fairly referred to as ornamental,—as decorative,—and yet there is undoubtedly good reason for caution in making an application of the term. Do what we will, the habitudes of common life inevitably affect the terminology which refined criticism has to make the best of, and when the popular ear has resolved upon associating upholstery and decoration, it is in vain to struggle or protest. Decoration may then maintain its place in the dictionary or in Roget's "Thesaurus" as accurately synonymous with embellishment; but its writ will no longer run authoritatively beyond these bounds, when it proves that art can only be qualified as decorative under the liability to be understood as at best only just outside of the ministrations of the plasterer and paperhanger. Every word that we employ, as John Locke observed long ago, is, without exception, relative,—it expresses a meaning only with an understood qualifying reference to some other word that remains unspoken, to some other idea which confronts it in the mind, though it may have no name at all. It is not merely that father implies child, and subject implies sovereign, but identity presupposes the notion of diversity, light implies shade, and so beauty implies recognition of the possibility of its absolute contrast, ugliness. It is by the operation of this law that the use of an expression without any restriction or qualification is in itself emphatic. That it stands alone is taken to justify the most absolute interpretation relatively to whatever term would most positively exclude and contradict it. A work of art, therefore, which is shortly adjudged to be a decorative work, will be understood as purely decorative, as merely decorative, good as decoration,—happy it may be to be recognised as successful decoration, but there is the end. No more being said, it will be held to chiefly merit our thanks for relieving the monotony of blankness, for palliating blemishes otherwise obtrusive, for performing well the secondary service of breaking the otherwise harsh transition from truly fine art to no art at all.

"Decorative," therefore, is a term sufficiently complimentary in regard to pretensions that are moderate and respectable, but which, when offered professedly as a compliment to superior ambition, will either be a compromise with conscience or mask depreciation which may even be something like an insult. It is because an insult may be felt when nothing of the kind is intended, that it is well to set forth emphatically the true meaning of the word; there would be still more reason for doing so and making its import notorious on a supposition of any necessity to deprive ill-nature of an opportunity for covert sarcasm. The chief contingency, however, that we have to consider is to preclude unwitting injustice by candid but careless use of a term which has a claim on its own part to be relieved from misappropriation. Certainly language makes an acquisition which we may be thankful for when it secures a concise expression which will pass current for a meaning that must otherwise be packed into a periphrasis. Decorative art in the sense just indicated, is a matter of fact that has to be talked about, and it is well that it should get an accepted name. What we have to guard against is that the word in its progress from an indifferent and general to a particular sense should get settled as soon as possible and get clear from the intermediate equivocal stage. Till this comes to pass, it will lend itself and be liable to all manner of abuse. Art which is decorative in the noblest sense, will be apt to be depreciated because the casual application to it of the term decorative introduces associations incompatible with dignity. If noble works are liable to be degraded in this manner, a mischief almost as great will ensue by false elevation accruing to the merely ornamental by such unmerited fellowship, and there is also the incidental mischief to be deprecated of stamping really good decorative work as in itself contemptible.

It is by no means premature or inopportune to give this warning,—to make this protest as to what logicians call the nondistribution of a middle term, of such frequent recurrence at present as decorative art. If it is to be employed sometimes for only part of its significance, the misconceptions it will introduce must be quite as serious as if it is to lend itself to contradictory implications; and this, indeed, is the inevitable result. Ingenuity can contrive no worse confusion than when characteristics are pretended to be defined by a term that is sometimes taken for one part of its significance and sometimes for another, and sometimes is applied in a manner that admits of either interpretation indifferently.

Let us interrogate that popular usage to which it has been said that defer we must as to what sense it has resolved to attach to decorative art, and we shall probably elicit that such art is held to be distinctly subordinate and secondary; to be superinduced in the interest of beauty upon somewhat that has in itself no claim to beauty, but which has claims in respect to which beauty more or less is comparatively a matter of indifference. Decoration, therefore, will be vulgarly regarded as in nowise a native growth in its position, but something brought and put there. From this point of view, works and objects of utility are decorated, and it is a relief that they should be, and it is desirable, doubtless, that the decoration should be good in itself and appropriate; but, after all, when utility is predominant, decoration if admitted is admitted indulgently and perhaps weakly, for the primary consideration of use will be jealously conserved against all encroachment. In such cases, and so far as commonplace interest has rule, it is only after requirements of usefulness have been decided on and provided for, that the question of decoration is allowed to arise at all, and take its chance of an opportunity, with the natural consequence that it is liable to be dealt with perfunctorily and inartificially enough.

It is too frequently an unhappy consequence that what is thus entertained and treated as an incidental and secondary consideration does not obtain the respect to which, on its own part, it is fully entitled. The happy point, says the Roman poet, was hit by him who combined the useful with the pleasant; but how much depends on the perfectness of the combination? If decoration is what it should be it will be found that its charm will be due in large proportion to the fact that the combination will be complete; the transition will, in such a successful case, betray no unnatural and violent surprises, but sequence and coherence will be preserved throughout. The suggestion and motives of the decoration will be found on analysis to be presupposed by the conditions of the problem which it accepts, and thence developed by imagination and pursued through a wealth of collateral associations. If the work to be decorated does not supply such motives in abundance to a lively imagination, this does but prove that in such a case an attempt at elaborate decoration would be inappropriate

It is probably as much because this reserve is too often neglected, and ornament is overcharged, as because the best opportunities do not receive adequate treatment, that decoration comes too frequently by an ill-name, as evincing rather mechanical attachment than growth as of an organism. The worst of such examples of overdone ornamentation is that they tend to reconcile the world to give up relieving decoration altogether, and to repudiate the notion that works of predominant utility need any more recommendation than their simple serviceableness. The accommodation of the engineer, it comes to be thought, like the beauty vaunted by the poet, is when unadorned adorned the most. But the laws of nature do not let us off quite so lightly; the option allowed to us is between beauty and ugliness. In the works of nature beauty is beneficently the rule; it asserts itself in the uncultivated wilds, and among the ruins of civilisation. But beauty does but in the rarest instances evolve itself spontaneously in the works of man without any exertion of the artistic faculty which is implanted in him, and which he is under responsibility to cultivate and exercise as much as his intellectual and active powers. There is no object of necessary utility, from the shovel at the fireplace to the iron cylinder that supports a railway bridge over a river, that is not likely to be offensively hideous if merely treated with reference to its service, but that is not susceptible of appropriate decoration; though the designer may be restricted, and if the designer will only frankly recognise his restriction, to the very simplest elementary curves. An object is not undecorated because the decoration is unobtrusive, and abstains in what we may call self-respect from challenging attention to itself independently of the very occasion that justifies its existence at all; and no occasion for appropriate decoration is to be disallowed, and as little on the score of severity as of simple triviality.

> "It was not meant,
> By him who on the back the burden bound,
> That cares, though public, critical, and grave,
> Should so encase us and encrust as shuts
> The gate on what is beautiful below,
> And clogs those entries of the soul of man
> Which lead the way to what he hath of heaven.
>
> —— Life,—life, my friend,
> May hold a not unornamented course
> Wherever it shall flow; be the bed rocky
> Yet are there flowers, and none of brighter hue,
> That to the rock are native. War itself
> Deals in adornments, and the blade it wields
> Is curiously carved and gaily gilt."

Even within the strict limits of decorative art most scrupulously defined, there is wide range for diversities of merit as well as of styles. Therefore it is that the term must be guarded against lapse into import of unqualified disparagement. The accomplished architect must ever be a master of decorative art in its best sense, inasmuch as his work comprises regard for the convenient in its most absolute relations; and this appeals to him, and not in vain, for such treatment as will enable it to blend harmoniously with characteristics of refined beauty and elevated dignity. Decoration proper, in this point of view, may be taken to express enrichment of the proper architectural members by graceful variation in systems of mouldings, of panels, diapering, foliation, and management of diversified colour and the application of gilding. The decorative treatment of minor members may be perfectly appropriate when it is appropriate to the spirit of the composition to verge towards the expression of the elegant, the playful, or even the fantastic.

If we press this consideration to the extreme we may even find ourselves constrained to admit that a work may be properly architectural and yet, in fitting place, be almost purely a decorative work, as exhibiting an indulgence of ornament out of all proportion to the modicum of practical convenience or utility that serves as a simple excuse for its agreeable display. Such a decorative work is, in fact, an ornament as a jewel is an ornament, or a trinket, or a dress-sword; it is much if it stands in the same relation to architecture that an *escritoire* does to upholstery, which is enriched with a luxury of fantastic extravagance which may be charming to look at, but which no one supposes to be more than infinitesimally useful, and is never intended to have even that degree of utility seriously put to the test.

To painting is usually assigned the most important part in decoration, and decorative art of considerable value may be exercised in the invention and execution of coloured patterns, arabesques, and so forth. So long as these attract and amuse the eye agreeably, their function is performed, and this is the most that is often effected or anticipated from flower painting, and even from landscapes. Very important pleasure may be ministered by these classes of painting, but the appreciation of them depends far more on refined sensations even as largely in the case of music, than on possession of knowledge or sensibility to the expression of passion and character. Paintings, which from their subjects have ostensibly a higher claim to position in art, may still belong to the class of decorative works, if their appeal to the sympathies is but trivial as compared with the force and directness with which they address the simple senses. Very much of the art of Tintoretto at Venice, and of Paul Veronese, is of this character. Notwithstanding the power of drawing and colouring, and composition, which is bestowed upon vast surfaces, the conviction as we gaze on many of their works will not be suppressed, that our enjoyment is rather sensuous than sentimental; our sympathies are invoked for technical mastery, brilliant execution, facility, and dash, for unimpeachable composition and invention, which, within a certain range, seems unfailing and inexhaustible; yet our delight is at last but evanescent, and we pass onward and away unconscious of that detaining and abiding influence which works far simpler exercise upon us, because they touch the heart. It is on this account that the brilliant series of Luxembourg pictures, by Rubens, in celebration of Henri Quatre and his bride, Mary de Medicis, is, after all, but decorative painting. We are affected much in the same manner as by imposing scene-painting, which at the moment takes possession of us as if the creation of genius, but very shortly after is removed, and we have not a regret to spare to follow it. Painting and sculpture, decorative in this humbler sense, may doubtless add a charm which is not to be despised, to the structures of the architect; but assuredly the best works of the architect have a claim to something more. For the opportunities which he provides in his noblest works he is entitled to ask as a return that the embellishments which painting and sculpture may provide should worthily emphasise the culminating spirit of his work. This is the very problem that is set forth in the project for the interior decoration of St. Paul's. Decoration proper has responsibilities enough in the distribution of gilding or bronze, or incrustation more or less extensive with coloured marbles, but it is surely with good reason that achievements of nobler scope than merely decorative painting should have been required to worthily occupy the most conspicuous and critical spaces. Art is redeemed from mere decoration when it is imbued with distinguished and concentrated character.

Architects have especial reason for jealous anxiety that the art which painters and sculptors contribute as the ultimate embellishment of their work shall not be considered good enough if merely ranking as superior decoration. The bronze doors of the Florentine baptistery are framed and bordered with foliage and animals of exquisite invention and workmanship, decorative art of the highest order, but the sculptured panels in low and diversified relief are replete with poetical character individually and by their poetical coherence, which gives them a truly organic connexion with the structure that is worthy by its design and beauty, —*mio bel San Giovanni* (Infern. xix., 17) that Dante should have been therein baptised. In the *loggie* of Raffaelle the same rule holds, though there, indeed, the ornamental element asserts predominance, and the full devotion of noblest painting to glorify the centralised control of Christendom, only bursts upon us as we enter the stanze. It is no fault, but a grievous misfortune, for the architect of genius, if so it be that genius in the other arts may not be forthcoming. to give the last finish to his work or be diverted by the accidents of the world elsewhere; but assuredly he has claim to the best assistance of the best genius in the collateral arts that his age affords.

The most important example that is furnished by the history of art, by the history of the world, of the worthy contribution by a sculptor of the culminating glory to a work of architectural genius is, no doubt, the Parthenon. It has been due to the confused conceptions which, as we have set forth, are apt to infest allusions to art as decorative, that the true relation here of architect and sculptor, of Phidias and Ictinus, has been grievously misconstrued. It were difficult to imagine to what other source could be due the suggestion which has been confidently launched to take its chance of gaining popular acceptance as a sensational paradox, that the Elgin marbles, being only decorative architectural sculpture, are not to be regarded as sculpture in the pure sense of the term, and, therefore, cannot fully represent the greatness of the works to which the fame of Phidias in antiquity was due. "The excellent good word" decoration will, indeed, "be brought into disrepute all over the realm," if it is to betray critics into such an enunciation as that only under indulgence of such a reservation can these marvellous remains be admitted to convey with any force the spirit of the sculptor's art. We have a very complete list and authentic descriptions of the works of Phidias, and it is a simple fact that the works which he contributed to give the crowning glory to the architecture of Ictinus had not only the unrivalled perfection of which we can still judge, but were, in fact, the most important compositions of most numerous figures, and those colossal in scale, that the best Greek genius of the best age ever produced. Whatever may have been, and must have been, the excellence of the great single temple statues and others produced by Phidias, it is clear that compositions full of diversified action and alive with emotion, made a demand on the resources of art which were not called upon in any way in the design of isolated figures. It is difficult to conceive what can be the definition of pure sculpture that would only admit the claim of such productions "under reservation." We might as reasonably disallow the Last Supper of Leonardo da Vinci as pure painting because it decorated a refectory, or treat the ceiling of the Sistine Chapel as mere decorative art, which, in consequence of its intimate connexion with architecture, could only be accepted with reserve, and somewhat rashly, as painting in a proper sense,—pure painting,—at all.

THE SAFETY OF EGRESS FROM PUBLIC BUILDINGS.

THE often-repeated efforts of this journal to secure proper care as to the means of exit from public buildings have been shown to come from no needless anxiety, by the heart-rending catastrophe at the Victoria Hall at Sunderland, on the night of the 16th of June, of which some account was given in our last number. The tender age of the sufferers, no less than the appalling number of the victims, tends to render this wholesale slaughter a calamity without precedent in our own country and time. Into the details of sorrow and of suffering it is needless now to enter. Neither is it fit, as we before remarked, considering the grave responsibility that must lie somewhere, to say a word that may tend to throw blame on any individual in anticipation of any verdict of a jury, or other judicial apportionment of censure. But it is of moment, while public feeling is at its height, to direct attention to the two points,—with respect to our protection from such misfortunes in the future,—of the organisation of crowds, and of the structural rules that should be enforced in all buildings constructed to hold a large number of people.

The Sunderland catastrophe, regarded only from the scientific point of view, has a special feature. Alone among the instances of crushing by crowds, it did not originate in panic. There was no rush of strong men, brutalised by panic-terror, tearing their way among those weaker by sex or by age. The tide of the infant sufferers seems to have accumulated almost with the quiet but irresistible force of hydraulic pressure. The children at the skirts of the column, to which they were unconsciously communicating a fatal acceleration, were unaware of what was occurring a little way down the staircase. We have said that the width of the staircase was about 8 ft. The great point in deciding on the proper width for a passage or corridor is, that it should be so proportioned to the dimensions of the human figure as to allow of two, four, or more persons walking abreast, without leaving space between them to tempt any one from behind to rush into the file. It is, however, quite another thing to allow such a width on a staircase as the sole exit for 1,000 persons,—which is said to be the number that the gallery could contain,—without some aid in the way of a central handrail to check

a too rapid descent. That, however, does not seem to have occurred in this instance. If we suppose an equable flow of six persons abreast down the stairs at the slow march rate of 62½ yards per minute, it would empty the gallery in 2⅔ minutes. Two hundred persons to each file is an allowance that has been made in the most famous buildings in the world, where the rapid exit of a large mass of visitors was likely to occur, and six in a rank gives a more ample proportion for exit in the present case.

But when the 7 ft. or 8 ft. are suddenly constricted to 2 ft., a case occurs in which the analogy of the flow of liquid would be altogether misleading. In rivers and conduits the occurrence of a constriction, although always undesirable, may at times produce no very sensible effect on the quantity of outflow in a given time, because the steady pressure behind drives the fluid through the neck at an increased velocity that makes up for the diminished area. In the case of a human tide this is impossible. The first law of safety, therefore, in the construction of passages of inlet and exit is that there shall be no local constriction. In the case of a staircase, where a sudden rush of people is possible, another factor is introduced, and we repeat, what we have said on many occasions, a wider staircase than 4 ft.,—where support by means of a handrail, or by a third person holding those who are supported by the handrail, can be had,—means possible destruction, such as we have seen in the present case.

The sound, safe, and ancient canon is habitually, —we may almost say universally,—violated in the public buildings of this country. And it is not the architect who violates it. On the contrary, the means by which the check is effected are for the most part the very scandal and stigma of architecture, added, it may be, by the joiner or the carpenter; and even if passing under the sanction of the architect, controlled by a higher power,—the power that seeks to collect £. s. d. It is true that in some places of public amusement this collection is the very *ratio entis* of the building. But for all that, no sound architectural canon can be violated without risk, or rather certainty, of mischief. Nor is risk of pressure the only one to be avoided. Some of our railway stations are so ruined in their access by the means taken to supply the public with tickets, that the passengers are detained for minutes in a through draught that may prove fatal, and often has disagreeable results. It *may* be requisite for the protection of ticket-collectors to restrict the communication between them and the passenger to the few square inches of opening at which the latter have to take their turn of patient or impatient attendance. The plan has been borrowed from the French banks; of which the customers of our English banking establishments have so natural and wholesome a hatred. But if this be so, and if it be a part of the arrangements of a company that the tickets for a train shall be issued within five or ten minutesof the departure of the same, the least that the public can demand is that there should be enough of these minnikin windows to allow of the transaction of the requisite business within the assigned time without the present undue crowding, haste, and discourtesy.

In a word, the necessity of bringing each person who enters a station, theatre, or other public building face to face with a money-taker or ticket-taker, is one which, if acknowledged, should not be permitted to interfere with the public convenience, health, or safety. It is inexcusable for it to do so, for the reason that it is as easy to obviate, as it is to foresee, the mischief. The canon is a simple one, and should be strictly enforced. Whatever constriction, for any purpose, is introduced into a channel of human flow, the arrest of the volume of passers in or out should be avoided by making the barriers as numerous as the general width of the corridor requires. Thus, if there is a corridor or passage from 56 in. to 72 in. wide, intended for the passage of four persons in a rank, and if at any period it be expected or possible that the passage should be so used,—then, if barriers be introduced that allow only one person to pass at a time, there should be four such barriers. By this means the influx, flow, and efflux of the human tide can be perfectly and safely regulated. And it can be done by no other means.

People are often very ready to throw blame on those of their fellow-sufferers, under the pressure of a crowd, who may deserve it as little as themselves. The case of safety of entrance or exit must be regarded, not on moral, but on physical grounds. It may be true that an English crowd is a rough one. Certainly we think it is a much more dangerous crowd to be in than an Italian crowd. As to comparison with a French or a German crowd we leave others to specify the likeness or the difference. But be it what it may, it is necessary to recognise and to deal with it. For the danger of pressure is not confined to the rough element of society. Nowhere is pressure greater, in England, than in the entrance to the throne-room at a levée, where all that is noblest and best bred in the country, in limited numbers, each person duly provided with a card to be handed to the Lord Chamberlain or his deputy, has to pass the barrier in the ante-room, and there a crush at times occurs which those who have felt it can never forget. To give one instance out of many,—as a personal observation,—we have seen the strong brass guard of the heavy sword of an engineer officer bent flat by the pressure at the barrier of the ante-room in Buckingham Palace.

Let us put the matter in a form with which it is easy to deal. The natural inclination, or sway forward, of a man whose feet are together on the ground may be taken at from 6 in. to 9 in. at the level of his chest. If he leans forward as much as that, he has to put out his hand for support. The pressure that will thus exist will depend on the angle of inclination, and on the weight of the individual. But we may take it at one or two pounds,—if the stop is made in time,—easily rising to two or three times as much, if the pressure is more violent. In anything like the struggle with a crowd, though the oscillation is checked, it is checked by the exertion of a certain resistance. Five pounds per unit of the file will probably be under the mark. But then this pressure accumulates, so that the fifth person (it is, at all events, quite conceivable) may be pushed against with a weight of twenty pounds. And in a crowd six or eight persons in rank, and perhaps 100 in file, it is easy to see how the pressure may become overwhelming on those who are suddenly arrested in their motion by the interposition of a barrier, without any single individual in the mass being in any way to blame. The pressure is a simple outcome of the law of gravitation, and is as susceptible of calculation as are problems of statics or dynamics. To talk about avoiding crushing in such a case by appeals to the crowd, is like Mrs. Partington mopping out the sea.

It is thus, we think, obvious that in dealing with a crowd we have to deal with a mass of human beings in each of whom the individual will, sense of decency, and love of order, are for a time at the mercy of purely mechanical forces, beyond ordinary control. In such cases it is the duty of the architect to provide that these mechanical forces should never be exposed to so sudden a mechanical check as to become mischievous from their very nature. Where a constriction is applied to a corridor, passage, or confused flow of human units, dangerous opposition to mechanical force becomes possible, and under certain circumstances, certain; and the rule that we have given, that the number of constrictions shall be such as to make up for their size, should, we think, be considered as absolute.

While the observation of a course that is in accordance at once with geometric and dynamical law, and with the practice of the most famous architects who have had to provide for the movement of large masses of people, would in itself render such a calamity as that of the Victoria Hall impossible, we should not overlook the importance of the introduction of organisation, wherever a crowd is collected. It was, if we remember rightly, the remark of no less an authority than the Duke of Wellington, on the occasion of the Great Exhibition of 1851, that there were very few men that he knew who could conduct 70,000 persons into, and out of, Hyde-park. But for the step in street organisation long since suggested by the *Builder*, and now common at certain points of crossing and conflicting traffic,—the presence of a policeman to give signal to stop or to go on,—there are not a few places where London, in the present heyday of the season, would be absolutely impassable,—one dense jam of carriages and men. In any large public assembly some regulation of the kind is absolutely necessary. One quiet, self-possessed man, with a wand, maybe, in his hand, may prevent a concourse from becoming a mob. Half a dozen stewards can effect the orderly and comfortable distribution of a mass of people who, in the absence of such guides, only obstruct and confuse one another. We should say that there is no instance in which the good effects to be wrought by the presence of a very small number of competent guides are so striking and so needful as in the marshalling of a crowd. We say nothing now as to the occasion which unhappily has called for these remarks. But we do say that two classes of persons are deeply interested in the study of the conditions that we have suggested. If the architect do his duty, and if his well-designed passages be kept free from the obstructions erected for the convenience of the money-taker, one cause of danger will be removed. But there still remains the danger, under certain circumstances, of the action of the crowd upon itself; and this danger is to be obviated by forethought, and by simple but properly designed organisation. It is the duty of those who collect crowds to see that they are not, by so doing, imperilling human life.

We are glad to see that one of the points on which we have repeatedly insisted, viz., the necessity that the doors of public buildings should be able to open outwards, has been brought under the notice of Parliament by a Bill introduced into the House of Commons.

THE IRISH LACE EXHIBITION.

WHATEVER may be the conclusions to be drawn as to the commercial value of the lace-industries of Ireland, there can be no doubt that the exhibition at the Mansion House includes a considerable quantity of very beautiful work. This is very well arranged in the "Egyptian Hall," and during the short time it will remain open the exhibition is likely to be a centre of considerable interest; it ought to be so, both for philanthropic and artistic reasons.

In regard to the former aspect of the subject, it is hardly possible for any who are not professed lace fanciers, or commercially concerned with lace, to form much idea how far the special manufactures here represented have a chance of independent prosperity on their own account. These things depend so very much on fashion, which may raise a demand one year for what it neglects the next year, and which is inscrutable in its ways and beyond the reach of merely human prophecy. A good deal of the lace in the exhibition is professedly an imitation of recognised standard styles, Venetian point and Spanish point especially; and as far as mere effect goes is not inferior to many examples of the original styles. If value is attached to artistic achievement rather than to the mere name of a country or locality, and if these very good Irish imitations can be produced at less cost than the Venetian and Spanish point can now be procured for (and they probably can), there ought to be a market for this work; as long, at least, as it can be truly said of every woman, as Dr. Johnson once said of every man: "Greek, sir, is like lace; every one gets as much of it as he can." Not that the Irish lace is only imitative of other styles; there is a good deal of individual style, but we were considering the imitations in the first instance.

From the book distributed at the exhibition it would appear that nearly all the establishments of lace-making in Ireland have been, like the present exhibition, of philanthropic rather than commercial origin; a consideration which, it is needless to observe here, is rather ill-omened for the future success of the Irish branch of the craft. It cannot, however, be productive of any possible harm, and may produce the best results, to call public attention afresh to the existence of, and to the value of, the work done by the various Irish lace-making communities.

The commencement of this work in Ireland was, comparatively speaking, very recent; none of it dates back earlier than 1820. At that date "Mrs. Grey Porter, wife of the rector of Dunnamoyne, taught her domestic servant, Mary Steadman, to make lace from a specimen she had brought from Italy. She succeeded so well that the then Lady Lyttelton and other distinguished persons gave orders. The circumstances became known to a Miss Reid, of Ahans, near Carrickmacross, who first sought to amuse her sister, Miss Dora, with the work, and afterwards conceived the idea of teaching the art to the deserving poor around her, as a means towards their support." This was the origin of the Carrickmacross lace industry.

Miss Reid built a school upon her property, and a subsequent manager of some adjoining estates, Mr. Tristram Kennedy, built several schools on his estate; it does not appear whether these were general schools or schools for teaching design and manufacture of lace only, but the latter was taught in them at all events, and the lace of the district took its name from the principal school at Carrickmacross. The Limerick centre was the next started (1829), and this alone is said to have owed its origin to commercial instead of philanthropic enterprise. It was, for a considerable time, commercially successful, but has now ceased to prosper, and "it is not now positively known that a single young girl in the city is learning to make lace as an industry by which she will earn her livelihood." But why is this? We find no explanation that can be considered satisfactory under the circumstances. The demand, we are told, daily declines, "but would soon revive, if work of a higher merit were reproduced." This seems rather like arguing in a circle. The trade appears to have fallen off, as far as we can gather, because there was no demand, and the best workers went elsewhere, or were not replaced by a new generation. That things are not on a very satisfactory basis in this respect is indicated by the brief account of the efforts made to promote the lace industry and the sale of its proceeds at the time of the famine of 1846. The sentence in which this is related is, we fear, sadly too suggestive of a deceptive economic basis:—

"Lacemaking was only one of many forms of labour that the benevolent adopted, but it soon became popular. It had one great advantage over many of the others, that it required no capital to commence. Whoever had the heart to do good could by teaching assist the poor to earn their bread. The difficulty was to get ready sale for what was made in the remote parts distant from towns and markets of any kind. To meet this general and national want, some ladies in Dublin formed themselves into an association, called the 'Ladies' Industrial Society for Ireland.' At their own cost they rented premises, paid salaries and all expenses of sale, opened correspondence with every English or foreign acquaintance to sell, free of charge, any Irish work sent to them, and to remit to their owners the full amount that their work realised. Thus lacemaking was assisted to secure a commercial basis (!), and though the society dissolved after a few years of active work, it prepared the way for the lace industry to become a commercial success."

And this is just after telling us that it is now at a complete standstill! If such are the economic prophets of Ireland, can we wonder at profits, with the other spelling, being so unsatisfactory? The passage we have quoted is delightful from the point of view of Mr. Ruskin; but what would the Charity Organisation Society say to it? Over and over again practical experience has proved, what economic theory assumes, that to make an artificial market for any industry in that way is only to buoy people up with false hopes, only to stave off an evil day which may sometimes be all the more evil, when it comes, from having been staved off. For the moment it has perhaps this excuse, that it is a way of giving people charitable help with less injury to their character and self-respect than by giving them money openly; it does them the momentary benefit of persuading them that they are earning their living. But it is charity all the same; and unhappily that is a sort of charity which, unlike the other quality hitherto translated "charity." in the Bible, "*always* faileth,"—in the long run. That single passage sufficiently shows why the Limerick lace industry is at a dead look now. It was revived upon a fallacious and deceptive economic basis. We by no means say that this is the only basis upon which the lace industry of Ireland can stand. Let it be shown either that better lace can be made there than elsewhere, or that lace equal to the more expensive types can be produced at less cost, and the Irish lace industry need have no fear. But it is impossible to read such remarks as we have been quoting without pointing the moral of them and giving a warning.

There appears to be, in fact, evidence in the work exhibited, and in some of the facts mentioned about it, that there may be some probability of increased success for Irish lace on sound commercial grounds, if properly made known. A great deal of the lace exhibited is artistically of very effective character. Some of the imitations of Venice point, made in the Clones district, with the crochet-needle, are hardly to be distinguished from ancient lace of that class, except in the want of that look of age which cannot be imitated, and of which the imitation is not to be desired in one sense; and if this can be produced, as we are told, at much less cost than the original, there certainly should be a demand for it among those who think more of the appearance of a thing rather than of its mere name. Among the laces which have local character, the "knotted" and "lifted" guipures from Clones are very effective, and have about them a curiously marked Celtic look, as if half-suggested by reminiscences of ancient Irish ornament. Among the cheaper work, which is not really lace, may be mentioned with approval the "pearl tatting," done in the Ardee district, of which some examples are very effective and unusual in design. In the same district a school was opened by a lady for teaching girls to make "Lacet," a lace (so called) which consists principally of braid or tape shaped into a design; this is made very cheaply, and though, of course, lace-fanciers would not accept it as "lace," it is a very artistic and effective ornament of its class; we had noted one specimen (in Case 8) for its effective design, before coming across the description of the mode of manufacture. But among the classes of work which are not imitative, and which have distinctly local characteristics, by far the best and most interesting is the Carrickmacross guipure, a lace made by tracing a design on a cambric foundation with a thread marking the outline, the superfluous parts being then cut away and the pattern connected by "brides." It is said by experts that this is not a good lasting or washing lace, which is, of course, a definite drawback to it, if it be so; it is also, we understand, looked coldly upon by connoisseurs as not having altogether the proper look of orthodox lace; but lace-fanciers, like pigeon-fanciers, have a conventional standard of excellence; we look at it from the impartial art-critic's point of view, and we say this is most beautiful work, equal in many cases to some of the most admired Indian patterns, and it is only prejudice which would say otherwise. Among the finest pieces of work there is a piece of point lace on a large scale belonging to the Duchess of Abercorn (Case 46), which is exceptionally fine and bold in design; but this is only one of the best among a number of specimens of very artistic work.

One other sentence we may quote from the report, as to the cause of the decay of the Kildare lace trade, and perhaps of wider application:—"The natural carelessness of the poor Irish always induces them rather to fall from than to go on to greater perfection. They more willingly make twelve bad collars for 5d. each than one good one for 5s.; never caring to learn that twelve inferior specimens of work more readily alienate twelve patrons than one good specimen can do to regain them." We fear this is only one out of other indications of the truth of what we have always believed, that much of the poverty and difficulties of Ireland arises from certain defects in the otherwise very attractive national character of the people.

Proposed New Lunatic Asylum for Lanarkshire.—It is stated that at a meeting of the County Lunacy Board, held in the Council Chambers, Glasgow, on the 13th inst., the sub-committee on sites concluded the final arrangements with Mr. Peter Forrest of Shotts, for the acquisition of his lands of Hartwood and Bowhousebog, and that at a meeting of the committee held the same afternoon the arrangement was approved and confirmed. Mr. Forrest's lands extend to about 500 acres, but as the committee expressed a desire that an additional extent should be obtained, arrangements were at the same time made for purchasing two small adjoining properties, which will bring up the total area to 600 acres. The lands are situated in Shotts parish, about two miles to the east of the Omoa station, Caledonian Railway, and have a slope towards the south. The committee have been engaged in the work of selecting a site for nearly three years. When completed, the new asylum will be on an extensive scale, and fitted up to accommodate 900 to 1,000 patients. The ultimate cost will be not less than 150,000*l*. The *Hamilton Advertiser* understands that the total price paid for Mr. Forrest's property and the two adjoining estates acquired, with the whole minerals in the lands and sixty dwelling-houses at Liquo, is 26,5[illegible]*l*.

IN AND ABOUT HAMPSTEAD-ROAD.

ST. JAMES'S BURIAL-GROUND.

"And Hogsdone, Islington, and Tothnam Court,
For cakes and creame had then no small resort."
GEORGE WITHER'S *Brittain's Remembrancer*, 1628.

"When the sweet-breathing spring unfolds the buds,
Love flies the dusty town for shady woods.
Then Tottenham-fields with roving beauty swarm,
And Hampstead balls the City virgins warm."
GAY *to Pulteney*.

THE London and North-Western Railway Bill for acquiring this site, in view of their intended works, passed its third reading by a majority of 16 over 157 votes. At length awakened to a sense of their position, the parishioners of St. James's, Piccadilly, resolved, at a meeting held two days before, on the motion of Mr. Oakley, to petition the Commons against the contemplated spoliation and desecration. It appears that as many as 50,000 interments have taken place since the churchyard was first acquired for the mother parish. Neglected and desolate during several years past, the ground was put in order by the trustees, they being nominees of the vestry, to serve as a place of recreation for the inmates of the London Temperance Hospital on its removal from Gower-street to new premises in the Hampstead-road, overlooking the disused cemetery. After some negotiations with the trustees, and amendments in the House of Lords, the railway company now stand to purchase one-third of the site (which altogether exceeds two acres in extent), and to make sundry improvements as regards the remainder.

The burial-ground was established about a century since in the then open fields to the south of Rhodes Farm, on the highway to Chalk Farm and Hampstead. It lay between Rhodes Farm and a reservoir of the New River Company,—site of Tolmer's-square,—the reservoir adjoining an ancient house, pulled down in 1808, named in various records King John's Palace. One of the first to be buried here was Lord George Gordon, who, confined in Newgate for a libel upon Queen Mary Antoinette, died in 1793 of the gaol distemper in that prison which his No Popery rioters had burned and sacked thirteen years before. Of other interments should be noticed those of John Hoppner, portrait-painter (1810), and, in the middle of the little square plot by the entrance on the left hand, George Morland (1806), many of whose stable scenes were taken from subjects in the neighbourhood, as well as from the cottages at Harlesden-green and Ball's Pond which he would often frequent. Long time separated from her husband, who died at a sponging-house in Eyre-street-hill, Leatherlane, his wife, surviving him but a few days, was laid by his side. In the Life of W. Collins, R.A., the son relates how his father, then a young man and a stranger yet to fame, attended Morland's funeral. When the attendants had left he forced his stick into the earth as far as it would reach, carried it carefully home, and when dry varnished it. Such was the veneration he felt for that wayward unfortunate child of genius.

This commonplace, unattractive quarter, indeed, is marked by reminiscences of many a celebrated artist, as reference to old Academy catalogues will evince. Here lived Scriven the engraver, and De Wilde, famous for his series of historic portraits in illustration of Bell's "English Theatre"; and in Tottenham-street lived the English Claude, Richard Wilson. George Cruikshank resided for many years in the Hampstead-road, near the St. James's Chapel; Charles Dickens passed a part of his boyhood in Sol's-row, so named from the "Sol's Arms," a sign he introduces into "Bleak House." In Sol's-row, too, whose pretty little houses and front gardens, north of the Adam and Eve Tavern, gave way to Charles-street forty years ago, lived David Wilkie, who, at No. 10, painted his "Blind Fiddler." The Adam and Eve in its earlier shape is made familiar to us by Hogarth's "March of the Guards to Finchley." It stood at the north-western corner of the junction of the present Hampstead and Euston roads on the site of the prebendal manor of Totenhall cited in Domesday Book as Tottenham Court, a property of the dean and chapter of St. Paul's. Held in succession by Sir Robert Dudley, to whom Queen Elizabeth demised it in the year 1560, by Sir Harry Vane, Sir Henry Wood, and Isabella, Countess of Arlington, it ultimately descended to her daughter, the Duchess of Grafton, and thus passed to its present possessors, the dukes of that title. Most of the streets, squares, &c.,

preserve the names of members of the house of Fitzroy. In Fitzroy-street lived the Countess of Melfort, more commonly known as Lady Caroline Drummond, only child of the seventh and last Earl of Seaforth, and a lineal descendant of King Charles II. A distinguished ornament of the literary and fashionable circles of her day, this lady, when a child, was a great favourite of Dr. Johnson, who, in allusion to her royal blood and the well-known sympathies of her race, used to call her "his little Jacobitish mistress." Parton, in his "History of St. Giles's," gives us a first mention of Tottenham Court as a house of entertainment, by an extract from the rate-books of that parish for 1645, when Mrs. Stacey's maid and her two companions are fined each a shilling "for drinking at Tottenhall Court on the Sabbath daie." Eden-street is built over the tavern gardens, once a highly-favoured resort, whence Lunardi, the aëronaut, would make ascents in his balloon (1785). An interesting view of the Adam and Eve, showing later additions, is contained in Hone's "Year-book." At that time,—it was taken in the year 1825,—the Paddington stage used to drag its slow progress along the New-road down Gray's Inn-lane to the City (the subsequent route to the Bank by the City-road on the part of a Hampstead coachman being considered a feat worthy of the mailéd voyager of Horace's Ode), performing the journey in about two hours and a half "quick time." Some other views of the turnpike, the palace, the manor-house, tavern, turnpike, &c., are preserved in Wilkinson's *Londina Illustrata*, and the Crace collection, British Museum. In the graveyard of the Foundling Hospital, where is Hogarth's painting, lies Nancy Dawson, a former inhabitant of Moll King's Row, on the way to Haverstock-hill, which is shown in the distance in that picture.

PASSAGES IN AN UNSUCCESSFUL CAREER.

III.—MY FIRST BUILDING.

IF the polite reader who has followed the story of my unsuccess so far should think that now I am about to harrow up his soul,—that now my troubles are beginning in earnest,—that the record henceforth will be one long catalogue of yielding foundations and tottering superstructures, of pervious walls and smoking flues, of unscrupulous builders and exasperated clients, of extras, arbitrations, litigation, and all their envious brood of "oughly-headed monsters,"—he would but disclose his ignorance alike of nature and of art. Of nature, because no worldly lot is uniformly and consistently unfortunate; and of art, because the effect of this narrative would be spoiled if there were no bright touches to relieve the general gloom. But, above all things, I should be falsifying history, and this shall not be done by me. No; my first building was entirely successful, and my first client is my firm friend to this hour.

My employment as architect happened in this wise. A friend bought a plot of freehold land, and cutting it in half sold each half for what he gave for the whole. He was, you see, an altogether different person from your humble servant. A golden harvest followed wherever he trod, and fortune smiled graciously upon all his enterprises. He is dead now, but, like Tennyson's Northern Farmer, "A died a good 'un, a did." I cannot say that in selling his land he attached as a condition that I should design the buildings to be erected thereon; but I think that, with a fine business tact, he contrived, at a critical turn in the negotiations, to throw in the suggestion with such adroitness that the desired result could not well fail to ensue.

It was by no means a large matter; but it taxed my ingenuity to the utmost. For the problem was the too common one of endeavouring to get a quart into a pint bottle; that is, of getting a pound's worth of accommodation for 10s., and giving to the work a character befitting the residence of a gentleman. When every imaginable compromise had been tried, and the needs of my client had been reduced to the lowest point, there was not, as may easily be conjectured, a very wide margin for architectural display. None, in fact. I contrived to obtain red tiles for my roofs, threw up some good lofty chimney-stacks of red bricks, pleaded for and obtained a little latitude in the matter of the staircase and the mantels, which were of hard woods, with panels of specially-designed figure tiles, and a little geometrical glazing here and there. It was rather hard work to make anything of it. However, such as it was, it was highly successful, and it led to some half-dozen commissions for residences of the same class, and, better still, many warm and enduring friendships. It is among the many advantages of an architect's profession that it brings him into closer social relations than almost any other. The lawyer is regarded by his clients with a sort of distrust. One's doctor is too variously and constantly occupied to be able to devote much of his time to the calls of friendship. You would not wish the dentist to be a frequent visitor,—fearing unpleasant suggestions of a professional nature. But the architect is a welcome guest in every house, and there is no calling which, when successful, has more variety or more opportunities of social enjoyment of the most agreeable kind, especially if one's practice lies in domestic work of the better sort.

In my first undertaking, I had the good fortune to fall into the hands of an honest builder, one who really was as anxious about his part of the work as I was about mine. He spared no trouble and no cost to do the thing in the best way. It is now a good many years ago, and his work has borne the test of time triumphantly. Perhaps he did his work too well in other matters, for I saw, less than a month ago, that his firm, after a long run of varied and important works, was bankrupt.

I may, perhaps, have raised a smile in an earlier essay by avowing my belief in the fair conduct of a great proportion of public competitions for architectural matters, and the smile may perhaps broaden into a grin when I say that I am a believer in the honesty of a large proportion of builders. I can only speak of them as I have found them, and I put it on record that my conviction, after a pretty long experience, is that scamped work when resorted to is often a retaliation for needless and officiously obtruded suspicions.

From this my first building has, with few exceptions, sprung almost all my professional employment, and my unsuccess lies in this, that there has not been enough of it, and that while others have more than they can do I have less.

I am perhaps as free from envy as another man, and I do not repine at the good fortune of the really great. I recognise a variety of mental as of physical stature, and as I do not fret because I am not 6 ft. high, I accept resignedly the failure to attain the intellectual and artistic standard of a Street, a Pearson, or a Norman Shaw. I may regret that it should be so; but I bow to the inevitable. But why A and B and C should have prospered so disproportionately perplexes and disheartens me. So far as I can see, their attainments are not beyond my own. They have neither a greater share of intellectual strength nor of artistic faculty.

"We were reared upon the self-same hill," and I had as good a start in life as they. Nay! better, for I shot a-head for awhile. Spurted, as I suppose my sporting friends would say, but had not staying power. But leaving all reference to one's personal acquaintances, who have made themselves a secure position in the profession, and turning to the works of the successful men of the day, are we, in every instance, struck with the superior ability displayed?

At the west end of the metropolis enormous buildings are rising thick and fast, covering a great historic site. The fortunate architects are reaping a rich reward. Do we exclaim as we approach these works, "Here, indeed, is architecture! What nobility of general form! What dignity! What a breadth of manly treatment! And with what enchanting refinement of detail is the whole vivified and adorned! We feel, indeed, in the presence of a superior mind. This is *art*, and *art* is priceless; and we grudge not the golden shower that fills the laps of these gifted ones." One might say all this; but it would be difficult to do so with a composed countenance.

No! I suspect that the one thing necessary for an architect is not skill in the art of architecture, but a touch of the commercial traveller. An artist friend of mine, who had failed to obtain the coveted A.R.A., told me, in the bitterness of his soul, that it might do a painter no *harm* to know something about painting, but that it was not the one thing needful. We may discount the sarcasm in consideration of my poor friend's disappointment, but there is, after all, a spice of truth in it. I cannot say whether there are painters who cannot paint. It has been alleged that there are sculptors who cannot "sculp," and it is within the knowledge of many that there are prosperous architects who never spend an hour at their drawing-boards. And it may be that this lack of the commercial spirit is the cause of failure in my own case. "Life," in the poem, said to the poet:—"As thou hast carved me such am I." I have built a few churches and chapels, a few schools, a public institution, some large houses and some small ones, and have had a few of those miscellaneous employments which go to fill up the interstices in the career of a professional man. But the whole, when spread over a quarter of a century, make so very thin a film that, but for a little "charing" and other aids, my fare would have indeed been frugal and my enjoyments few.

As I review the past, however, I can but temper my own complainings by remembering the brave hearts which have broken and gone down utterly in the struggle from which I,—though torn and maimed,—survive.

> "Where are you, old companions trusty
> Of early days here met to dine?
> Come, waiter, quick, a flagon crusty,—
> I'll pledge them in the good old wine.
> The kind old voices, and old faces,
> My memory can quick retrace;
> Around the board they take their places."
> * * * * *

"Soft! 'twas but a dream"; for here I sit, alone, in the solitude of my deserted office, the evening of life closing in, with a plentiful lack of employment,—a too abundant leisure to reflect upon the incidents of an almost fruitless career,—and so conditioned, financially, that I look forward with unaffected interest to the receipt of the modest cheque with which a generous (but discriminating) editor will reward these excursions of an idle pen.

CAFÉS AND COFFEE-HOUSES.

IN the modern crusade against what one constantly hears denounced as the "national vice," it is agreed on all hands that there has been no more powerful ally in favour of that temperance, which is even more desirable than teetotalism, than the increased consumption of tea and coffee, and the opening in every direction of coffee palaces, coffee-houses, and people's *cafés*. One occasionally hears from interested quarters of the value of public-house property having been affected, a fact which it is not difficult to believe, in face of the actual influence upon the national budget produced by the increased temperance of John Bull. This wonderful change, which is already threatening to affect that comparatively exclusive, however extended circle, known as "society," has, as we have already remarked, been largely brought about by the increased consumption of tea and coffee. Such has been the success of the movement in favour of the opening of a number of *cafés* as counter attractions to the pleasures of the public-house, that it is important that the continuance of its efficacy should be ensured.

It is our opinion that much may be effected in this direction by largely improving the character of those *cafés* which have so far been attempted. Comfortable as these in a measure have undoubtedly been made, there yet remains much to be done to render them more attractive, to ensure their being as influential for good upon the eye and mind as they have proved thus far upon the health and fortunes of their frequenters. No one has ever hinted that the attractiveness of the ordinary public-house,—however gorgeously landlords may have considered it necessary of late years to decorate their places,—was dependent upon the beauty either of the bar or the sanctuary of the coffee-room. It has, however, to a great extent, become understood that a large share of the attractiveness of the modern coffee-house must consist in the proper supply of some form of intellectual or pictorial amusement. This has been fully appreciated in many quarters, but we repeat,—and it is a question eminently suited for our pages,—more may be done in this direction.

It is almost impossible in this connexion not to be tempted to speak of *cafés* abroad, though it is not our intention to put forward as an example to copy, the foreign *café*, such, at least, as most people picture to themselves those establishments, — the *cafés* of the French capital. It is a mere platitude to state that the extreme difference of temperament, general

education, and climate preclude the possibility of the direct adaptation to our country of such an institution as the usually accepted type of the foreign *café*, where,—at least, in Paris,—the coffee, which in the past was the speciality, is daily being driven out by beer, after a terrible period, which we hope has reached its climax, of a rage for absinthe. No French *café* could be taken as a model, however many agreeable features they may seem to possess.

If any foreign *café* could be pointed to as an admirable model, to all who know the Continent there are no *cafés* superior to those of Vienna, that city of *cafés*, where coffee was first introduced into our Western existence,—it was only the other day that the 200th anniversary of the event was *fêted*,—and where coffee of the best quality is almost all that is supplied, together with free and generous use of card-rooms, chess-rooms, billiard-rooms, conversation-rooms, and, —we are not exaggerating,—several hundred papers, in every European language, handed about by polite and utterly unobsequious waiters. To dream of the possibility of our ever having in London such a *café* as the Café Central at Vienna,—one of the modern architectural wonders of the world; such electrically-lighted *cafés* as the Café Schnitzar, or the Café Arcaden, with coffee,—the famous *mélange* of Vienna,—a cake, polite attendance, and unlimited and constantly renewed glasses of ice-cold water supplied at 6d. a head, is, we suppose,—we know not why,—beyond the expectation of the Londoner, though he may boast of inhabiting the richest and largest city in the world. Is it, we ask, strange that with such places of amusement to go to as the Austrian and the German have in their capitals and in every town of any importance, — the Berliner in his handsome Wiener *cafés* on the Unter den Linden, *cafés* in which cool fountains play among greenery, and ladies in the smartest toilettes come and chat with their friends, flower-girls flit about, and the whole air of the place suggests a crowded reception without its boredom,—is it wonderful, we repeat, that when the foreigner is supplied with such places of amusement, even the *caffé* of the smallest Italian town has about it a smack of thrifty conviviality? Is it extraordinary, whatever vices we may accuse Continentals of possessing, that foreigners generally should be more temperate than we, that the habit of frequenting the drink-shop is confined almost exclusively to the lowest and most degraded, those whose laborious habits admit of the use of stimulants; that the toper sneaks into the dramshop down some quiet street where he may hide from the world a taste which, we in England, seem fiendishly to endeavour to spread by placing public-houses and bars conspicuously in every thoroughfare and every building frequented by the public?

There is a singular difference in the manner in which the foreigner uses the *café*. The Frenchman is little of a reader, the few newspapers supplied are glanced over for the journal in accordance with the political bias of the customer. It is to talk, and show his grand airs and fine clothes, that the Frenchman chiefly frequents the *café* of his preference; with the Italian it is much the same. The local gazette and a few journals from the capital form the whole stock of current literature in the smaller *cafés*, the waiter as often as not,—though he thoroughly understands his place,—entering freely into the general conversation of a group of his patrons. It is very different with the German and Austrian; since Austria and Germany have received the benefits of a free press, there is no more greedy reader than the German *café* frequenter from Hamburg southwards to Buda-Pesth. The leading papers of every town in the kingdom, three or four English, half a dozen French and Belgian, several Italian, Russian, Swedish, Danish, Polish, Hungarian, and other papers, will, in the leading *cafés*, be found carefully supplied.

Cafés and coffee-houses are spreading in every direction in our country, and to return to our original contention, there remains much to be done to induce those who frequent these *cafés* to regard more seriously those amenities of existence which are the inevitable accompaniments of that life of refinement to attain which every one in a measure is striving. To the architect it is evident his work in this direction is to endeavour to render the building with which he may be entrusted as comfortable and cheerful as possible; to those generous patrons who so far have come forward to assist in such undertakings, there is always left the question of wall-decoration, which, however much a difficult matter, requires only consideration. As a proof that expense need enter very little into the matter, we have in our mind the recollection of a very large number of prints which the owner has modestly termed his "penny collection," formed of gatherings from illustrated newspapers,—chiefly, it is true, foreign,—a collection which contains reproductions of some of the finest works of art, prints, pictures, portraits, and antiquities which the world's museums can show.

But,—and here we come to a practical question,—a chief step in the direction of improvement can be made in the quality of the coffee supplied at such establishments as are now springing up in every direction. We are aware that those whose habit it has been to consume large quantities of intoxicating liquors pine for their "pint" of coffee or tea, but there is no reason why the "superior do.," as it is termed on the tariffs,—should not be really what it professes. It will be admitted, we think, by all our readers that there is no more frequent complaint among those who of late years have "swored off," than the difficulty of obtaining a good cup of coffee. Why English people should tacitly accept the statement so often repeated, that one only gets good coffee abroad, and good tea in England, we know not. With this desideratum supplied with more certainty, with our *cafés* made more attractive, there is no reason why our community should not be divided, as it is in all other countries, into two great divisions,—those who, without subscribing to the exactions of teetotalism, prefer *café* life and its accompanying refinement and wholesome social amusement, and those who prefer life at the dram-shop and the bar. To which of these two sections to belong, it ought not to be a very difficult matter for sensible men to decide.

THE PICTURESQUE IN CEMENT.

THE representation of this element in architecture seems to be the object of a book of designs for houses which has been published by Mr. Lascelles,* the well-known builder, who has done so much in the way of suggestion and improvement in the uses of concrete and cement in building. The designs are described on the title-page as made for execution in Mr. Lascelles's "patent cement slab system"; and we presume the term "cement" has been adopted for what is really a very fine concrete, as better describing to the general reader the nature of the material, as something much less rough and intractable artistically than concrete in the usual sense can be said to be.

For the knowledge that these are designs for concrete houses we are, however, entirely indebted to the title-page. For all that appears in the character of the design we might conclude that these were a set of brick houses in Domestic Gothic style, with mullioned windows, some of them half-timbered. We sincerely hope that in the latter cases the timber-work at least is genuine, and not a concrete or cement imitation; it is shaded in the drawings as if it were timber, but there seems such a desire to persuade people that they may have concrete and cement slab houses quite undistinguishable in appearance from houses built in more favourite and generally used materials, that we do not feel sure how far the deception may be carried. At all events, the drawings here are just like hundreds of other pretty drawings made by practised draughtsmen in the present day, many of which, in the same kind of style, may be seen annually on the walls of the architectural room at the Royal Academy. As sketches of house-architecture, the majority of the designs are pleasing, though we are unable to follow out the delicacies of distinction which constitute one design "a riverside house," another "a roadside house," &c. As far as we can see, they might be "whichever you please," as the saying is. The special distinguishing element of "a house for the Midlands" appears to consist in putting a number of the windows in the external angles of the walls, leaving the angle of the wall supported (to appearance) only by a mullion of the window, the opening for the window being cut out of the two faces of the walls at right angles to each other. This may be piquant; its peculiar suitability to the Midlands we hardly profess to understand; but what is quite obvious is that such a way of placing windows is not very good building, and (consequently) not very good architecture. A design for "a house by the sea" (E. S. Prior, architect) has just a hint of more definite special character, in a certain solidity of appearance, and an untouched mass of wall towards the base; but this kind of expression should be carried out more forcibly, if attempted at all.

In reviewing the Building Exhibition of last year we remarked upon the too great tendency of those who were endeavouring to recommend concrete, to make it in imitations of other and quite different materials. Mr. Lascelles addressed a letter to us then in defence of his procedure, very frankly admitting that in order to recommend his material he was making it look as like materials in ordinary use as possible, and quoting precedents for doing so. We have referred to his letter again in connexion with this book, and perceive that the essential point of our criticism is hardly understood. If a maker finds it convenient to make cement slabs in the same shape and size as tiles, and to give them, in making, a colouring matter giving the colour of red tiles, we have no objection; it is merely another way of making tiles: the colour may be accepted as more agreeable than that which the uncoloured cement would assume. But when the cement is made in slabs of 2 ft. or 3 ft. square, and then the surface treated so as to appear like a conglomeration of tiles of the ordinary size and colour, that is ridiculous. That series of small overlapping surfaces is the natural appearance which tiles assume from the way they are put together on a wall; but the appearance is not in itself a thing beautiful enough for imitation for its own sake; and to imitate it deliberately with a material of quite another nature made in a different way and in larger pieces, is a proceeding which is ludicrous in the eyes of persons of true taste and feeling in such matters: and the same reasoning applies in other cases. If concrete is made in the size of bricks, put together as bricks, we see no objection to mixing colouring matter with it so as to approach brick colour, if that is supposed to be more pleasing to the eye; that, again, is merely another way of making bricks. But if it is made in larger slabs and jointed to resemble brick, that is an architectural absurdity. Whether anything so illogical is contemplated in the designs in this book, we cannot guess, as the drawings give no clue to the practical method employed. All we see in the drawings is an apparent collection of tolerably pretty brick and half-timber houses, recalling the style of a good many old English houses, but which we learn from the title-page are intended for execution in an entirely new method and materials, not existing when the style of house from which these are derived was evolved. Abstractedly, no doubt, Mr. Lascelles is right, both commercially and on other grounds, in wishing to have the houses built with his materials to look picturesque, and we give him full credit for the good intention. But he has not got the right man yet. To imitate the picturesque character of a house style which arose under perfectly different conditions is not the way to do it; that is only shirking a difficulty. New materials give the occasion and opportunity for new treatment; but that is not to be done without more thought than has been given to this matter yet.

* Sketches for Country Residences: designed to be constructed in the Patent Cement Slab System of W. H. Lascelles. By Ernest Newton, architect. London: B. T. Batsford (no date).

Newcastle-upon-Tyne.—Messrs. R. & W. Hawthorn, one of the oldest and largest engineering firms in this district, have taken possession of their new and extensive range of offices, at St. Peter's, which have been carried out in red brick, with stone dressings; (the interior finishings being of oak and pitch-pine) from plans prepared by Mr. William Glover, architect. They consist of partners', private, and waiting rooms, board and manager's rooms; drawing-office, designing-room, and counting-house. Second floor, — Telegraph, telephone, photographer's department, and plan store. Ground-floor, — Time-office, inspector's room, and general stores. The contractor, Mr. Walter Scott; Mr. Robert Preston, slater; Messrs. Walker & Emley, heating, ventilation, and plumbing; Richardson & Co., painters and glaziers; Chubb & Sons, fireproof doors; Swan & Co., electric light.

MODERN HOSPITAL CONSTRUCTION.*

IN response to the invitation of the Council of the Parkes Museum I am to address you to-night upon Hospital Planning, a subject embracing nearly every purpose for which this Memorial Hygienic Museum has been instituted.

Whatever sanitary principles and appliances are needed to make an ordinary dwelling-house sweet and wholesome, within which *healthy* people may live, breathe, and have the full enjoyment of their being, must necessarily be of paramount importance in the case of those who are *sick*. And, still more, the congregation of many disabled and diseased persons under one roof obviously calls for very complete and careful arrangements and special contrivances for the preservation of the purity of the earth, air, and water, both within and around the buildings thus exclusively devoted to the reception of the sick and the healing arts.

It may not be without advantage, therefore, to occasionally pass in review the progress made and still making in the design and construction of hospitals generally,—military, civil, and pauper,—and the improved application of sanitary principles in their construction and maintenance.

Dr. Mouat (our chairman) has divided such buildings into five groups, "the successful treatment of disease being the cardinal condition, or *raison d'être*, of every such institution," thus:—

1. Clinical hospitals, or hospitals attached to or forming part of medical schools, as University and King's College Hospitals.

2. General hospitals, or those in which all classes of cases, medical and surgical, are treated, with or without detached wards for infectious diseases and parturition. In this group Dr. Mouat places the great separate Workhouse Infirmaries.

3. Special hospitals, such as fever and small-pox hospitals, lying-in hospitals, ophthalmic, skin, orthopædic, and other institutions, devoted to specific purposes, as indicated by their names.

4. Cottage hospitals.

5. Convalescent hospitals, the "missing link" between the hospital and the home.

Dispensaries, free and provident, and all institutions which have no beds for taking in-patients, are excluded from the foregoing list.

In a mixed audience it will be undesirable to be either too technical or too detailed in the treatment of the subject in hand; but with the assistance of the numerous drawings with which I have sought to illustrate the paper, it will be possible to obtain a pretty clear idea of where we are, and what should be aimed at, in our studies, yet further to develope the science of hospital hygiene. In all such efforts, it is always essential to success that the public should be sufficiently well informed to be able to recognise and encourage the promoters and originators of every improvement as it appears.

The fitness of means available, to ends attainable, is the best use to which technical education can be turned. And I know of no better training for a young architect, who would be useful as well as ornamental, than the study of the various English and foreign works in hospital construction, sanitation, and general arrangement, especially if he follow it up by making original designs based on the information so obtained, confirmed or otherwise by personal inspection, observation, and comparison of existing examples. Such designs are all the more likely to be practically valuable if they are made in answer to invitations to architects to compete for the erection of some public building of the kind.

It was in this way that I acquired what little I know of the subject of which I am now treating; and the room is surrounded with a series of early designs prepared by me in competition for the various hospitals whose titles appear in the drawings exhibited. Some of these are premiated designs; some are neither premiated nor executed; and some are both.

It is not, however, by my own designs that I propose to illustrate this paper,—I exhibit them as studies, not models,—but rather by the process of comparative analysis afforded by the representation of a series of typical examples of existing buildings, drawn to one scale, and placed side by side.

But a few prefatory remarks are needed as an introduction to their consideration, for it was not till the death-rate in hospitals as formerly built had increased to an alarming extent that the public conscience was awakened, and its responsive echoes were heard in the House of Commons.

The lessons learned in the Crimean war will go far to redeem its losses. It is now nearly a quarter of a century since the report of the Barrack and Hospital Improvement Committee and the report of the Commissioners on the Sanitary Condition of the Army appeared, and by its authoritative recommendations, based upon world-wide and most voluminous evidence, firmly established what is commonly known as the "Pavilion system" of hospital planning, the simplest form of which principle was exemplified in the Hounslow Hospital, with the pavilions in line having a central administrative department and single-story wings for wards for the sick in the same axis as the main building. The Bucks Infirmary is a good example of a civil hospital on this plan, of two stories, and there are many other examples exhibited.

The more extensive and complex form of the same principle found its happiest embodiment in the great Herbert Hospital at Woolwich, a full and complete description of which was presented to both Houses of Parliament in 1865 in the form of a report by its chief designer, Captain Douglas Galton, who was assisted by the leading authorities of the time.

In this admirable essay little of novelty is left to be said upon the general subject, and the building it describes still continues to be, though one of the earliest, yet one of the best of the great modern hospitals.

The valuable series of papers by George Godwin, F.R.S., the editor of the *Builder*, did much at that early time to popularise the new principles, which consisted in the entire separation of the sick wards in distinct buildings or pavilions, united only by a covered or closed corridor on the ground story with the administrative departments of the hospital.*

The conclusions to which the Royal Commissioners arrived under the presidency of the late Lord Herbert were summarised as follows, and laid down as the principles to be observed in the construction of all military hospitals:—

1. The cubic space per bed to be 1,200 ft. at home, and 1,500 ft. in tropical climates.

2. In the construction of new hospitals the adoption of separate pavilions with lateral windows in opposite sides and natural ventilation.

3. The use of Parian cement or other impervious material for walls and ceilings.

4. Sufficient provision for warming and lighting the hospital.

5. The introduction of water-closets and sinks with efficient sewerage by impervious drains free of the buildings; the closets and sinks to be cut off from the hospital by a ventilated lobby.

6. The provision of suitable lavatories, baths, and laundries.

7. The use of stone or fireproof material for staircases and landings instead of wood.

8. The introduction of cooking apparatus.

The Barrack and Hospital Committee appointed in 1857, by Lord Panmure, on the recommendation of the Royal Commissioners adopted these principles as the basis of its proceedings, and set about their practical application, which afterwards bore good fruit, as we have seen in the foundation of the Herbert Hospital.

The first thing that claimed the attention of the committee was the form of the sick wards, and the minimum and maximum number they should contain, for most wisely they considered that the accommodation required for the inmates should be made to govern the shape of the hospital, all other portions being made subsidiary.

The best form of wards in military hospitals, in the opinion of the committee, was thus defined:—

1. The wards for the sick to be 24 ft. in width, at least, to ensure the requisite facilities for ward work.

2. The wall space for each bed to be not less than 7 ft. 2 in.

3. The height of each ward to be 14 ft.

4. The superficial area per bed to be 87 ft.

5. These dimensions give a cubic content per bed of 1,218 ft., which is very nearly that recommended by the Royal Commissioners for home stations; but the committee wisely added that the maintenance of the superficial area per bed was of more importance than mere cubic space. The maximum number of beds to a ward was fixed at thirty-two, and preference was given to the plan of placing the beds between the lateral and opposite windows, instead of next blank walls, with end windows, which would reduce the accommodation more than one-half to obtain an equally cheerful and well-lighted ward. The number of beds to be placed between the windows was limited to two.

Great simplicity in the heating and ventilating processes was recommended, and the separate warming and ventilating of the lavatories and water-closets was adopted in addition to the cross-ventilation by windows of the entrance lobbies to the conveniences,—the use of which latter in winter was impracticable, and consequently the ventilation of these conveniences had previously commonly been into instead of away from the sick wards, the higher temperature of the latter sucking in the foul air of the former.

Open-fire ventilating-stoves were recommended for heating the wards, but it is doubtful if the ordinary radiating stoves will always be found sufficient in long wards of the size recommended, with so large a surface of cold radiation from the windows and walls, though well enough for smaller wards.

The indirect manner in which a room is warmed by radiation, the open fire heating the walls and furniture, and through them reflecting it back into the room, creates a limitation in their fitness for this purpose, the opposite end walls of the wards being too distant to get warm or reflect much heat. It is, therefore, desirable to supplement the open fire by hot-water piping during the winter months, over which the fresh air admitted may pass, and be sufficiently raised in temperature without losing its freshness.

It is only fitting in this place that I should put you in possession of Dr. Parkes's opinions on this subject, briefly stated by him in the second edition of the ninth chapter of his now famous work of 800 pages, entitled "Practical Hygiene," which has gone through five editions, the last being edited by his successor and sometime associate, Dr. F. de Chaumont, Professor of Military Hygiene in the Army Medical School at Netley. In his opening remarks, Dr. Parkes pays a high tribute to Miss Nightingale's work entitled "Notes on Hospitals," which gave an impetus to the study of the subject, and led to the publication of many works on hospital construction and management in England, France, Germany, and America, which, taken in connexion with Mr. Godwin's professional papers, formed my chief text-books when preparing the designs exhibited.

Dr. Parkes sounds a note of warning as to the dangers necessarily arising from the aggregation of many sick people under one roof, and he draws attention to the risks of contamination of the air and of impregnation of the materials of the building with morbid substances being so much increased thereby that the greatest care is necessary that hospitals shall not become pest-houses, and do more harm than good; but he also assures his readers that a great supply of air, by immediately diluting and rapidly carrying away the morbid substances evolved in such quantities from the bodies and excretions of the sick, reduces the risk to a minimum, and perhaps removes it altogether. The quantity of air required for this purpose is very large, which he estimates at an average of 4,000 cubic feet per head per hour.

As an important means to the end desired, Dr. Parkes gives his adhesion to the pavilion form of building for large hospitals, the detached sick wards being wide apart, so that 1,000 sick should spread like a village. From 100 ft. to 120 ft. superficial should be given to each bed, in his opinion, and from 1,500 ft. to 2,000 ft. of cubic space. He prefers natural to artificial ventilation dependent on the movement of the outer air, and on the inequalities of weight, and consequent pressure, of the external and internal air. Upon this point there is a variety of opinion, and doctors differ very much. He limits the width of the wards to 24 ft., with opposite lateral windows reaching nearly to the ceiling, and considers that there

* A paper by Mr. E. C. Robins, F.S.A., read at the Parkes Museum on the 28th inst.

* We may be pardoned for stating in the interests of truth that these endeavours, obligingly referred to, in conjunction with the works of the late Mr. Robertson, of Manchester, and Miss Nightingale, preceded the erection of the buildings above named, as well as others, and which in some cases were avowedly founded on the publications in question. Our own reward was the rapid spread of the principles then enunciated, and the concurrent advantages resulting to the human race.

should not only be good ventilation, but that the wards, in turn, should be empty for two or three weeks in every year. The fewer the number of stories the better, single stories being the best arrangement. The ward walls to be lined with impermeable materials, and the floors of hard wax-polished wood, the furniture being reduced to a minimum.

Dr. Parkes gives an illustration of the arrangement of the lavatories, water-closets, baths, &c., at the end of a 26-ft. wide ward,—extracted from Miss Nightingale's book, which he approves,—showing the cross ventilated passages to the same, on either side of the large window at the extreme end of the ward. A stove is provided for warming each passage,—to the slop-sink and water-closet on one side, and to the bath, urinal, and lavatory on the other.

The patients in a ward may be any even number between twenty and thirty-two, and separate small wards for one or two beds should be provided; also a ward-scullery and nurses' room, with window overlooking the wards.

Where space and means are sufficient, day-rooms are most desirable, but more especially an external ambulatory.

Dr. Parkes proceeds to say that with regard to the supply of food, the diet of the sick is now becoming a matter of scientific precision, and he adds that the kitchen should be centrally placed, but quite apart from the sick-wards, and means should be taken to keep food warm in hot closets near the wards.

Hot and cold water to be supplied everywhere, and the supply to be from 40 to 50 gallons per head daily. Every contrivance to save labour and cleaning should be employed,—lifts, tramways, and speaking-tubes,—to save time and enable the attendants to give their full attention to their patients.

Dr. Parkes gives but two illustrations,—the Lariboisière Hospital of Paris, and the Herbert Hospital of Woolwich,—which latter he considered "the best military hospital in the country, or perhaps any where." By comparing the illustrations I have given, an obvious defect will be noticed in the former building, namely, the enclosed central court, from the sides of which the pavilions project, while free and uninterrupted openness to every wind is the distinguishing characteristic of the latter.

The Lariboisière has not proved a healthy hosiptal, but the Herbert Hospital is eminently so, especially since more warmth has been given in winter.

The Herbert Hospital consists of four double and three single pavilions, of two floors each, all raised on basements, and connected by a 12 ft. wide corridor. There is a convalescents' day-room in the centre pavilion. The administration is in a separate block in front. The axis of the wards is a little to the east of north. There is a corridor in the basement, through which the food, medicines, coals, &c., are conveyed, and then by a series of lifts elevated to the wards.

The terraces on the corridor afford easy means of open-air exercise for the patients in the upper ward. The wards are warmed by two central open fireplaces with descending flues, round which are air-passages, so that the entering air is warmed. The lavatories and water-closets are separately warmed and ventilated. The floors are supported on iron joists, filled in with concrete, and covered with oak floor-boards.

There are 650 sick inmates in this hospital,—twenty more than are accommodated in Lariboisière. The large wards, for 32 beds each, measure 117 ft. by 26 ft. by 13 ft. 6 in. high. The superficial floor area is 97 ft., and the cubical contents, 1,315 ft. per bed.

Professor de Chaumont, Dr. Parkes's successor in office, in his report on the Norfolk and Norwich Hospital, says that the height of wards is to him an important question; for that nothing is gained by making them more than half their width, or 12 ft. high, the width of the wards being 24 ft., and the superficial space, 100 ft. He had proved by experiments upon which tables had been constructed, that there is practically no difference in favour of 1,400 cubic feet per bed and 1,200, the floor-space being equal, the conditions of the air being relatively identical at the end of the second hour. Taking into account, therefore, the increased difficulty of warming the larger space, and the greater cost of construction, there would seem to be small advantage gained by passing a certain limit of height, to say nothing of the disadvantages referred to, and the increased cost.

Then, again, as to limits of practical ventilation. Professor de Chaumont says we can hardly hope to change the air oftener than three times in the hour without draught, and as 4,000 cubic feet is the minimum that ought to be given per head per hour, the third of this, or 1,333 cubic feet, ought, therefore, to be provided as air-space per bed. With 108 ft. of floor-space, 12 ft. 6 in. high would give 1,350 cubic feet per bed, which, if changed three times in the hour, would require 4,050 cubic feet of fresh air per bed per hour, which is generally considered to be sufficient for all practical purposes.

As regards the temperature of the air thus introduced and exchanged as a means of ventilation, the Professor proceeds to say that it ought to be remembered that in cold weather in this country, warming part of the air is necessary, if a sufficient supply is to be brought in for sanitary requirements; and that for this purpose air brought in directly from without, over coils of hot-water pipes, is best for a large ward. In this view I quite accord; and in the Training Hospital at Tottenham, now building, I have adopted this plan as an aid to the open fireplace, which I still retain for the sake of its cheerfulness and companionship, and its aid as a means of expired air extraction by its flue.

The wide divergence of opinion in the many subjects connected with hospital construction and management makes it unwise to be empirical; it is enough to commend what seems the best and to condemn what has been proved the worst, and between the two extremes to be content to give the opinions and the arguments supporting them, without attempting reconciliation. Time and experience can alone judge between them.

As Mr. Snell has observed in his introduction to the second section of the valuable work on modern hospitals, which has just been published by him and Dr. Mouat:—"While most of the now generally-accepted principles of hospital construction are nearly identical in all countries, yet in the practical application of them to matters of detail considerable diversity exists. On the other hand, there are a few important points, such, for example, as the question of aspect, upon which no two authorities appear to be in entire accord, for it would not be a very hazardous conjecture to make, that from amongst all the best pavilion-hospitals now existing, an axis could be found for every two points of the compass. Then, with regard to the even more important question of cubic space requisite for sick wards, we find this varies in general hospitals of admittedly good type from 1,300 ft. to 2,500 ft. per bed, and the floor space from 90 to 150 superficial feet per bed."

The Marylebone Infirmary.

From military we may now pass on to workhouse hospitals, and it will be sufficient to describe the latest, said to be "the most perfect building of its kind yet erected," which was opened by their Royal Highnesses the Prince and Princess of Wales. The architect was Mr. Henry Saxon Snell, whose experience and skill gained from the erection of five other large metropolitan infirmaries has culminated in this, the Marylebone Infirmary at Notting Hill,—full particulars of which will be found in the work from which I have just quoted, and in a previous volume published by Mr. Snell on "Charitable and Parochial Establishments," wherein he has given the results of his large experience and patient perseverance in the endeavour to raise the character and efficiency of these houses of refuge for the London poor. This great building gives accommodation for 744 inmates, in thirty-six wards of two beds in each, and twenty-four wards of twenty-eight beds each, in distinct pavilions.

The main corridor, connecting together the various blocks of buildings, is 10 ft. wide; it runs through the centre of each double pavilion, and has passages 6 ft. wide leading off from it to the various wards. It is enclosed with rising sashes, and is roofed so as to form an ambulatory for the use of convalescent patients. The main sick wards of this building are similar to those of the Herbert Hospital, being planned as pavilions, in pairs, connected together, in each case, by a staircase, duty and day rooms, and other offices; but each double pavilion, owing to the necessities of the case, contains three floors of wards instead of two, as at Woolwich. The height of the eaves of the roofs of the pavilions is 39 ft. 6 in., and they are situated nearly twice their height apart. Each ward is of parallelogrammic shape, and contains twenty-eight beds, is 84 ft. long, 24 ft. wide, and 13 ft. high. The total floor space, equally divided gives 72 ft. per bed, and the cubical contents 936 feet per bed. The average lineal wall space is 6 ft. per bed.

The system of warming is that of open fireplaces, combined with hot-water heating pipes, on a principle invented by the architect. This apparatus is known as the "Thermhydric grate," and is one of the exhibits in this museum. Its construction is such that the sides, back, and top of the fire are surrounded by a wrought-iron case containing water, and communicating by means of short tubes, with upright coils of pipes, so placed on either side that the water when heated by the fire circulates through them.

The medical officer of St. Olave's Union gives his testimony in favour of these stoves, stating that they gave out from 3° to 5° more heat, and consumed a third less coal, than the previous stoves in use.

"The ventilation of the wards," says Mr. Snell, "is effected by purely natural means, and is dependent, therefore, upon the very simple and well-known fact that heated air will always rise to a higher point than the colder air surrounding it, and that in its passage it will carry away with it noxious gases and other deleterious matters which would otherwise, by reason of their greater density, remain stationary or descend to the floor-level." The fresh air is brought in under the bed-heads, and is extracted by horizontal channels in the ceiling between each pair of beds communicating with 14 in. and 9 in. vertical ventilating-flues in the walls. The general ventilation of the wards is supplemented by the central stoves and upcast shafts in the side-walls, the total area of the outlet and inlet flues being 15 ft. in each of these sick wards. In the separation-rooms, 1,300 cubic feet of air-space is given to each of the two beds. The cost was only 177*l.* per bed.

In the year 1867 I was engaged by the guardians of the parish of St. Pancras to erect several dispensaries, having successfully competed for the enlargement of the workhouse, which, however, was not then carried out; but I won a premium for my design for the St. Pancras Infirmary in the year 1869, the plans of which are exhibited to-night, consisting of five blocks of wards, three stories in height, with separate administrative block, and all connected by the usual corridor, forming an ambulatory over, as shown in the perspective view.

I now come to the consideration of general hospitals, some of which, both in England and on the Continent, I have personally inspected; and for others I shall be dependent chiefly on the well-attested facts given in Dr. Mouat and Mr. Snell's book, which cannot be too highly praised, and will always remain a useful *aide-mémoire* to the profession, and reference-book for the student, to whom, I must also recommend (in addition to Mr. Godwin's essays and Captain Galton's reports in the Herbert Hospital and the Norfolk and Norwich Hospital, and his papers in the *Lancet* in connexion with Dr. Sutherland) the reports of Messrs. Bristowe and Holmes and the treatise of Dr. Oppert and M. Husson, the latter so highly praised in Miss Nightingale's book.

An admirable *résumé* of the papers in the *Lancet*, entitled "Principles of Hospital Construction," was given during the year 1874 in an architectural contemporary. In 1881 Dr. Mouat described in the *Lancet* two remarkable foreign examples, with reference to which I shall have something to say farther on; in the mean time, let us glance at a few of the more important modern examples of the new principles of hospital planning.

The Blackburn and East Lancashire Infirmary

is an example which is usually quoted, but is not one to be imitated in many respects. The accommodation is ultimately intended for 158 beds, in fourteen wards for eight beds, three for six, eight for two, and twelve for one each.

The general plan consists of eight ward blocks besides the central administrative blocks, arranged alternately on each side of the connecting corridor, which is three stories in height, including its basement. The comparatively small wards for eight beds only are 39 ft. by 22 ft. 6 in. wide, and 16 ft. high, having an area per bed of 106 ft., and a cubic space of 1,700 ft., the average lineal wall-space being 9 ft. 9 in. The ward opens directly into the corridor,—the staircases being projected on the opposite side of

the same; and the ward scullery, and bath, and water-closet, &c., are huddled together at the end of the wards, without any attempt to obtain cross-ventilation, and neither the slop-sink nor the water-closet has any window opening directly to the air.

There are no nurses' rooms, and I instance this example to show that there still remains the necessity for much watchfulness over the manner in which the details are carried out in public buildings; doubtless these defects will be remedied in the wards still unbuilt.

The Leeds General Infirmary

is one of the finest provincial hospitals, and was designed by the late Sir Gilbert Scott, for 328 beds. The axis of the wards is north and south; the three northern wards are two stories in height and the two southernward blocks are three stories in height, the building being thus accommodated to the great fall of the ground from north to south. The wards are projected from the northern and southern sides of a central hall, the purpose of which intermediate building is not quite apparent. The low corridor surrounding the central open space without the intervening hall would have been better; but, better still, a single corridor with double ward blocks, as at the Herbert Hospital, would have been an improvement. The lowest floor of the southern ward blocks need not then have formed a part of the administrative offices; ample space would have been attainable between the southern block offices and the ward corridor, or wings might have been added to it. As it is, the kitchen offices are situated beneath the sick wards, and not only so, but the basement contains the laundry, the dead-house, and the post-mortem room, all which it is always considered very important to keep as distant from the sick-wards as possible. As there was no lack of land in this case it is the more remarkable that this oversight should have occurred.

The wards themselves are admirably planned. The distance between them is 2¼ times their height. The four large ones towards the south contain 32 beds each; the six towards the north contain 28 each. The former are 126 ft. 6 in. in length, the latter 112 ft. All are 27 ft. 6 in. wide; the lower story is 16 ft. 6 in. in height, and the upper 20 ft., which Dr. De Chaumont would consider undesirably large; 107 ft. is the superficial area per bed, and the cubical contents of the lower wards are about 1,760 ft. per bed, while those of the upper wards are 2,136 ft. per bed. The average lineal wall space per bed is 7 ft. 5 in. The sanitary appliances at the canted ends of the wards are well arranged, but are not separately heated, so that the air within them has a tendency to be drawn towards the warmer atmosphere of the wards. There are no day-rooms, but the nurses' rooms and staircases are situated at the entrance of the wards, and since the separate erection of nurses' quarters, a single-bedded separation ward is thus available to each ward.

The heating of these wards by stoves has been found insufficient, and is being supplemented by steam piping. The inlets for fresh air have mostly been closed, owing to the coldness of the wards, and the outlets more often form inlets than extraction-shafts. In this case it is evident that the architectural has dominated over the practical interests, and therefore this otherwise magnificent building can scarcely be deemed a model one.

St. Thomas's Hospital.

This hospital has but few of the defects of the last described building, except such as have resulted from attempting too much on so confined a site. If it had been one story less in height it would have answered all the purposes, for it is too costly in maintenance to keep full, and arrangements have been made to turn a portion of it to the service of private paying patients. The situation of the kitchens and dining-rooms under the wards, and the nurses' rooms in the attic story, is not happy, but was a necessity in this case. The axis of the six ward-blocks is east and west, and they project towards the river from the low range of buildings next Palace-road. The pavilions are six stories in height, including the basement and the attics. The three uppermost of the four remaining stories are the sick-wards, which are well arranged for twenty-eight beds in each, are connected together by staircases and by corridors on the ground and first floors running the whole length of the building. The wards are 120 ft. long by 29 ft. 4 in. wide, and 15 ft. high; the superficial space is 126 ft. per bed, and the cubic contents 1,886 ft. per bed. The lineal wall space per bed is 8 ft. These wards are 3 ft. wider than is necessary.

The wards are heated by three stoves, and supplemented by hot-water pipes. Heated shafts withdraw the vitiated air. The ventilation is fairly successful.

The offices are in a separate block, next the bridge. The mortuary, lavatories, and workshops are in a separate building at the opposite extreme end of the site.

The chapel is in the centre of the main building; and overlooking the space between the pavilions are the matron and nurses, the waiting-rooms and operating-theatres, the officers' apartments and the out-patients' department. The total accommodation is for 573 inmates, and the cost, not far short of 1,000*l.* per bed, including land and furniture and the costly foundations, is much too great. Mr. Snell says,—"The total cost of the buildings, exclusive of the site, was at the rate of 777*l.* per bed, of which 85*l.* per bed was spent in the foundations, the total cost being 969*l.* per bed," or five times the cost of the Marylebone Infirmary, yet with 171 fewer beds in the total accommodation. Yet it has cost one and a half times less than the Hôtel Dieu, which cost 2,500*l.* per bed, half of which was spent in acquiring the site. It is a building of palatial character, and highly creditable, nevertheless, to the skill and practical knowledge of the architect, Mr. Currey.

The Glasgow Western Infirmary.

This charming and picturesque building illustrates a retrograde application of the pavilion theory, and except that cross-ventilation is retained by the opposite windows of the wards, is in no sense a pavilion hospital at all.

The administrative department is mixed up with the sick wards, which are not disconnected from the main blocks or from each other by the usual low cross-ventilated corridors.

In the central block and its wings there are two stories of sick-wards over the entrance-hall and board-room, kitchen and scullery, housemaid's pantries, doctors' dining-rooms, and bed and sitting rooms, &c., in the rear of which is the laundry. The other blocks have three stories of sick-wards, the out-patients' department being under one of them.

The accommodation is for 388 sick inmates. Each ward of the double pavilions contains eighteen beds, and is 70 ft. 6 in. long, 26 ft. wide, and 15 ft. high; the superficial area per bed is 108 ft., and the cubic space, 1,620 ft. The average lineal wall space per bed is 7 ft. 10 in.

The sanitary arrangements at the ends of the wards are not properly cross-ventilated by windows, nor are they heated at all, therefore they cannot be commended. But the heating and ventilation of the wards is on a sound principle. The stoves are assisted by hot-water piping, and the fresh air is warmed on its entrance and the foul air is extracted by four 18-inch square gratings communicating by shafts with a space heated by the hot-water cisterns, by which aspiration is accelerated. The products of the combustion of the gas-lights are not, however, carried away separately. The total cost has been 318*l.* per bed.

The Royal Infirmary, Edinburgh.

This splendid building more nearly represents the ideal of a pavilion hospital than any I have yet quoted, always excepting the mother of them all,—the Herbert Hospital,—and does honour to its architect, Mr. David Bryce.

The old buildings were devoted to the administrative department, with a new entrance-hall and offices, on each side of which is the two-story corridor connecting the surgical ward blocks, six in number, and two operating-theatres. In the rear is another single-story corridor, connecting the four medical blocks, and a corridor at right angles therewith, communicating with the administrative block.

Both medical and surgical ward blocks are three stories in height above the basement, which is used for stores only. Separate blocks are provided for the operating-theatres, surgical and medical, the superintendent's and porters' residences, the lecture-theatre, the infectious wards, the pathological department, the workshops, the engine-room, the laundry, the mortuary, &c., all in addition to the administrative block.

The total accommodation is for 586 beds. The medical wards, for twenty-one beds each, are 115 ft. long, 28 ft. wide, and the height 13 ft. 6 in. and 15 ft. The superficial floor-space is excessive, viz., 149 ft., and the cubic contents of the lowest floor is 2,015 ft.; the next, 2,201 ft.; and the top, 2,238 ft. Why the lowest floors, which seem to need the most, should be least in height is not obvious at first, but is desirable, owing to the tendency of the air of upper wards to be contaminated by that of the lower wards, through the lifts, staircases, and general means of communication in the hospital, but all are high enough,—in general they are too lofty. The lineal wall-space per bed is 9 ft.

The increased area per bed is owing to the position of the fireplaces in the side-walls; there are three in these wards, and the fresh air is warmed in its entrance through them. Openings for fresh air are between each bed, and extract-shafts aspirated by the heat of the hot-water cisterns, on which it is not usually well to depend, especially where, as in this case, the insufficiency of the heating by stoves has necessitated steam-pipes being introduced along each side-wall, some of which could be concentrated in a steam-heated shaft or extraction-chamber.

The sanitary offices are both heated and ventilated. The gas-pendants are also ventilating-lights. The floors are of polished pitch-pine, and the walls are covered with a polished parian cement face.

The surgical wards are similar, but for fourteen beds only. Ample arrangements are made for nurses, duty, day, and bed room; also for a doctor's room and separation ward for two beds, besides the staircase at the entrance of the wards, and in this contrasts strongly with the Blackburn and Leeds Infirmaries. The axis of the wards is east and west, so that the windows face north and south. The cost, including land, was 577*l.* per bed.

The Norfolk and Norwich Hospital

is the last of the hospitals of the United Kingdom that I think it necessary to quote particularly. It consists of a central administrative block, with operating-theatre and wards in the rear of it, and two double pavilions, two stories high, on each side, connected by a corridor of one story, 10 ft. wide and 10 ft. 6 in. high, with ambulatory over. Projected on the south-west are the nurses' dining-hall and the chapel. Separate and distinct blocks are devoted to the isolation-wards, out-patients' department, nurses, museum, and sheds and mortuary. The laundry is at the south-eastern extremity of the site. The axis of the wards is south-east and north-west. The total number of patients is 218. Cost, 300*l.* per bed. The wards contain twenty-four beds in each. Their length is 100 ft. by 26 ft. wide, and 14 ft. high. The superficial area is 108 ft. per bed, and the cubical contents, 1,511 ft. per bed. The average lineal wall-space is 7 ft. 10 in. Dr. De Chaumont and Captain Galton both reported on these hospital plans. I have quoted the opinions of the former, and, at the suggestion of the latter, stoves were used for heating, and Mr. Snell's Thermhydric stoves have been employed.

The ventilation is sensible, and like that at St. Thomas's Hospital. The sanitary offices are heated and ventilated by means of hot coils of water-pipes placed in chambers situated in the louvred turrets of the towers. Fresh air is abundantly admitted and extracted, and two ventilating sun-burners assist materially in extracting the foul air. The sanitary offices are exceptionally good,—cross ventilated by the passage leading to the towers at the angles. Altogether this is a very satisfactory example.

Antwerp Civil Hospital.

I now come to the consideration of one or two of the most remarkable foreign buildings. The year before last I had occasion to visit Belgium in company with two technical schoolmasters to inspect a series of buildings heated by hot-water upon the high-pressure principle adopted by Messrs. A. J. Bacon & Co., of Antwerp, in different parts of the kingdom, notably the hospital at Ath.

On my return to Antwerp I stayed to inspect the new hospital there, which greatly impressed me. I had seen Mr. Snell's design for a workhouse infirmary upon the system of circular wards, as suggested by Professor Marshall, and given in his work on charitable institutions, but the Antwerp Hospital has since been drawn and described in the work which Dr. Mouat and Mr

Snell have recently published,—to which work I shall also be obliged to refer for the plans and description of the now famous German hospitals which I was unable to see on my tour in Germany last January twelvemonth, being entirely absorbed in the inspection of the Great Polytechnic and Science and Art Schools of that country and Austria, Bavaria, and Switzerland, in company with Professors Armstrong and Ayrton, of the City and Guilds Institute for the Advancement of Technical Education.

M. Baeckelmans was the original designer, but the acting architects are MM. Belmeyer & Van Kiel. The hospital is an irregular parallelogram in form, with canted ends, and the separate blocks are united by the connecting corridors, 10 ft. wide, and one story in height.

The circular wards are external to the said corridors, and the administrative offices are within the same, except the blocks at the two ends.

At the southern end is the main entrance; the offices and residences of the chief officers, midway between which and the first pair of circular wards is the operation-room on the west side, and the mortuary on the east side of the connecting corridor. In the space between the first pair of circular wards is the chapel.

In the centre of the building, between the next pair of wards and their offices, is the kitchen, dispensary, and officers' dormitories. In the space between the third pair of circular wards are the nurses' apartments and dining-rooms. Between the last pair of wards are the baths, and beyond all, at the extreme northern end, is the detached laundry. The site is entirely surrounded by public roads, and comprises nearly 10 acres, and the cost will be about 360*l.* per bed. There are 380 beds. There is a basement about 8 ft. high throughout, and except for heating apparatus, and fuel, and for ventilating purposes, it is not as yet appropriated.

The sick wards, circular on plan, are 61 ft. 6 in. in diameter, with an average height of 17 ft. The total floor-space is 149 ft. superficial per bed, and the cubic contents 2,525 ft., including the nurses' room in the centre, formed by low partitions between the circle of supporting columns.

The average lineal wall-space, or rather space at the foot of the beds, is about 7 ft. per bed. The area of light is 28 ft. per bed from the eighteen windows. There are two stories of wards only, and the system of heating and ventilation will alone cost 12,000*l.* The fresh air will be passed over coils of hot-water pipes contained in a chamber situated in the basement under the central portion of each tier of wards; and the air so heated will be forced in by fans, turned by machinery fixed in the laundry building, through the upper parts of the central columns. The removal of the foul air is through the 10 in. by 8 in. gratings near the floor, between each window and each pair of beds, communicating with descending flues and horizontal channels to a central chamber heated by hot-water pipes, from the top of which is carried (right through the centre of the wards) a large iron shaft terminating above the apex of the conical roofs. Thus the fresh air is pushed in by fans, warm or cold as may be desired, at the level of the caps of the columns, and is drawn out by the aspirated central flue through each of the gratings near the floor beneath the heads of the beds. Consequently the ventilation is not dependent on the weather, but can be maintained in all weathers, and the collective areas of inlets and outlets, and the flues connecting the same, are carefully calculated and made of sufficient size to change the air of the ward about three times in the hour without draught, so that it has not time to get foul.

The sanitary offices are a model of good arrangements rarely found abroad; they are entered by cross-ventilated corridors, 12 ft. long and 4 ft. 3 in. wide. They are half the height of the wards, and the space between is left open for the free passage of air. All these offices are specially warmed and ventilated, and they consist here of a duty-room, a bath-room, water-closet, urinals, and lavatories.

The three separation wards for single beds, and the lift and staircases, are situated at the entrance of the wards, but are separated therefrom by a cross-ventilated corridor or bridge.

The Hospital of St. Eloi, Montpelier, France.

From Belgium it is an easy transition to France, and the instance I select is one that illustrates the most advanced phase of French hospital building introduced by M. Tollet. Dr. Mouat has thus distinguished it:—"M. Tollet's system may be briefly described to be based on the sub-division of the sick into small and manageable numbers, lodged in single-storied buildings, distributed over a sufficient area to prevent undue pressure upon space, and yet so connected as to be facile of access and administration. His wards are built upon the plan of the Gothic arch, to avoid all stagnation of air or arrest of organic or other matters floating in it by angles or corners of any kind; are intended to be easy of heating and ventilating in winter and summer, without the adoption of expensive mechanical contrivance; to admit of the provision of ample superficial and cubical space for each patient; to be constructed of materials capable of the most perfect cleansing, and to be as nearly as possible fireproof; to be provided with verandahs, to which the beds can be transferred, with little or no disturbance of the sick, in fine weather; and to have the accessories of baths, water-closets, and dependencies of all kinds so completely cut off as to be unable at any time to impair the purity of the atmosphere of the sick-room."

This hospital is divided into three distinct and quite independent portions. The first is the main building, which occupies the great central oval, and consists of eighteen single-story sick-wards, projected from the sides of the open connecting corridors surrounding a central court within, and at the entrance end of which are the administrative departments, chapel, &c.; also receiving-wards, and officers' and nurses' apartments, &c.

The second is the contagious diseases department, placed at the northern and eastern corners of the site, and enclosed by a belt of trees; the disinfection-rooms, the mortuary, and post-mortem room are to the north. The third is the maternity department, on the southern side, in two distinct buildings, surrounded by trees.

On this plan, M. Tollet has already built a large military hospital at Bourges, consisting of twelve pavilions, and the success has been complete. Dr. Mouat is of opinion that M. Tollet's system fulfils all the conditions of salubrity required in hospitals, more completely than any other form of structure with which he is acquainted; but the natural system of warming has been found deficient in winter.

The General Hospital of Friedrichshain at Berlin

is one of the best of the many admirable examples in Germany of hospital construction, and will be all-sufficient to indicate the advances made in the adaptation of the pavilion system. The military hospitals at Berlin, Düsseldorf, Königsberg, Custrin, &c.; the University hospital at Heidelberg, described by Mr. Gordon Smith; and the Dresden public hospital, are all excellent examples.

The civil hospital of Friedrichshain was completed in 1874, and took six years in building. It was the result of much study, in which all the most eminent German authorities took part, and it has issued in the production of a building which, as Mr. Snell observes, "may be said to mark an important era in the science of hospital construction," adding "the introduction of one-storied pavilions, although limited to the surgical division only, is especially commendable, as being the possible forerunner of a total abandonment of the principle of erecting hospitals, two, three, or more stories in height. The French have already commenced the erection of hospitals, the sick-wards of which are all of them but one story in height, and there can be little doubt that the universal adoption of this principle is but a question of time."

In the general arrangement of the site, the administrative offices are in front, towards the west, and at the extreme east is the kitchen, wash-house, and engine-house block, of three stories above the basement, between which are the chapel and the Roman and vapour baths, both within the central court, 700 ft. by 150 ft. wide, formed by the open paths at first intended to be covered ways, connecting the administrative offices and the kitchen block with the entrance ends of six sick-wards, situated equidistant from each other with their axes due north and south, or exactly opposite to those of Heidelberg, the axes of which are due east and west. I think the former arrangement the right one. The distance between them is seven times their height. The mortuary is to the north of the kitchen and laundry block. These general sick-wards are in two stories above the basement. So also are the two infectious wards at the south-west of the site.

On the north side of the general hospital are the four single-storied surgical wards, with an operating-room between the northernmost of the wards.

This is a pavilion hospital pure and simple, without even the usual connecting corridor either open or closed, but simply paved pathways, with the surgical wards of one story only, and no sick-wards more than two stories in height. What Miss Nightingale said of the Lariboisière sick wards, that "they were as distinct from each other as if miles apart," is much more applicable to these buildings. Separate buildings are provided for the ice-house, married officers' quarters, and nurses' institute.

The total accommodation is for 600 beds,—16 wards for 28 beds each, eight for 8 each, 32 for 2 each, and 24 for 1 patient in each, and the cost was 350*l.* per bed. The large wards for 28 beds are 97 ft. long, 29 ft. 9 in. wide, and 14 ft. 6 in. high, or about 107 superficial feet per bed, with cubical contents of 2,076 ft. per bed, the lineal wall-space per bed being 6 ft. 11 in. The area of light is about 24 ft. per bed, with double sashes. The wards are paved with tiles, and the walls plastered and painted. The sanitary offices are well fitted with English apparatus, but there are no cross-ventilated lobbies, nor anything to prevent the air of these places contaminating the air of the ward, except the general ventilation, which has been carefully thought out.

The advantages and disadvantages of heating by hot air or by hot water were elaborately discussed, and specially reported and experimented on, with the result that all the buildings, except the infectious block, should be treated by hot-water circulation. But an open fire is placed at the end of each ward, and in the day-room beyond, from which entrance is obtained to the verandah, into which patients can be wheeled in fine weather. The fresh air is passed into the ward over the warmed pipes, about 6 ft. from the floor, through the three pedestals enclosing the coils, and passes upwards, and returns to the exhaust gratings situated near the floor, which communicate by flues with the iron flue in the great chimney-shaft, at the base of which a fire is going at all seasons, by which means the air in the brick shaft enclosing the iron smoke-flue is carried forwards and upwards by rarefaction, on the principle described by Professor Tyndall in his speech at the opening of this institution by the Duke of Albany.

Besides the two single separation wards, the single-storied surgical wards have an operating-room. The medical wards have two separation wards of two beds each. Between these wards and the nurses' room and duty-room, which latter overlooks the great ward, there is a cross-ventilated passage. If a similar cross ventilated passage had been added to the conveniences and lavatories by increasing their lateral projection, these wards would have been perfect. I think, if nurses were polled, they would give the preference to narrower windows and a single bed between each window, instead of the usual number of two.

I have little to add to what has now been advanced, but sufficient has been said to show how much has already been done towards the solution of the great problem with which we set out, viz., How can great hospitals, with hundreds of sick congregated within their walls, be kept going with as healthy surroundings as a private residence in the country? and I think we may conclude that few such dwellings could compare with the wards of the great Civil Hospital at Berlin.

I have said little of the defects of the older hospitals. I must refer you to Miss Nightingale's "Notes" for these criticisms,—valuable as warnings,—and will be content to quote one passage, which, by its great contrast with our present practice, will at least show the advances made in the last century.

Miss Nightingale observes,—"By far the most remarkable illustration of the effects produced on the sick and maimed by agglomeration is that afforded by the experience of the Hôtel Dieu at the latter end of the last century, and before its reconstruction after the fire, on the plan which I exhibit, and which cost nearly a million and a half of money. There was direct atmospheric communication

through the entire suite of wards, occupied by above 550 beds on a single floor. The whole hospital contained 1,200 beds, but the beds by no means represented the number of sick, who were sometimes placed together in the beds as close as they could lie. And in this way, from 2,000 to 5,000, or even 7,000, sick were sometimes in the hospital at one time, and *one out of every four patients used to die*. So late as the year 1788, *each of the beds* in the Hôtel Dieu was intended to hold either two or four sick."

M. Husson, in his book entitled "Étude sur les Hôpitaux," shows that in the sixteenth century, and notwithstanding the use of multiple beds, holding, in 1515, from eight to twelve patients in each, the number of sick in the Hôtel Dieu so far exceeded the bed accommodation that the beds in 1530 were occupied by relays of patients, and forms were provided in which the sick whose turn it was to be out of bed could rest in the meantime. "Say not that the former times were better than these, for thou speakest not wisely concerning this thing." But I think we shall all agree with Miss Nightingale that the subject is almost too painful to dwell on, especially as we must take it for granted that the administration of the period acted according to the best of their judgment. Only let us not reproduce, even on a small scale, the same structural defects or mismanagement which led to such terrible loss of life. We may, at least, congratulate ourselves that every patient has long since acquired the right to his own separate bed,—a right, however, which has not yet been fully extended to schools, but is rapidly being so, and in the form of separate cubicles in the one large dormitory.

I have no time to describe details of construction, but this museum contains sanitary materials and appliances and working models of ward windows and hospital apparatus generally, in great plenty, and well worthy of careful study.

NEW FACTS AS TO THE COST OF INLAND TRANSPORT.

THE Select Committee on Canals, which sits every Thursday, is eliciting very valuable evidence as to the cost of transport, both in the United Kingdom and abroad. On the 24th of May, Mr. W. H. Bartholomew, M. Inst. C.E., gave evidence as to the very cheap rate at which a special kind of what we may call a water train, designed by himself, has been now for some years at work on the Aire and Calder navigation. Mr. Allport, of the Midland Railway, gave evidence that the length of sidings on that line was equal to that of the line itself. He also quoted the returns of coal borne by railway into London, which in 1882 came to 6,546,000 tons. According to evidence before the Railway Rates Committee in 1882, the average price of the 5,233,618 tons of coal brought by railway into London in 1877 was 6s. 5d. per ton; the rates falling from 0·55d. per ton per mile for 102 miles lead to 0·39d. per ton per mile for 260 miles lead. The latter is the longest lead of coal on our English railways, there being no competition with the sea from Newcastle. At the same rates, 2,100,000*l.* will have been received by the railway companies for bringing coal into London in 1882. But the aggregate cost of the five lines carrying coal into London,—viz., the Great Western, the London and North-Western, the Midland, the Great Northern, and the Great Eastern,—is more than 219,000*l.* per mile. Nor does this by any means represent the full cost of this part of these lines, as it is the average cost per mile over the whole length of the railways in question, including much single line; while 450 miles of treble and quadruple way have been laid within a mean range of some seventy miles from London. The mineral traffic now forms upwards of 22 per cent. of the average gross receipts of the railways of the United Kingdom. But it occupies the lines for more than half the working time. Thus it is understating the question to say that an outlay of 100,000*l.* per mile has been made by the companies in question to provide for the carriage of minerals into London. But the total gross receipts per mile for the traffic cited comes only to 12,000*l.* per annum, and at a price of ·49d. per ton per mile, no one, however sanguine, could pretend to expect more than 10 per cent. profit. On that showing, taking everything in the most advantageous way for the coal traffic, an outlay of some 100,000*l.* per mile in capital only earns a net income of 1,200*l.* per mile, or 1·2 per cent. on the amount of capital, tending to reduce the general dividends of each line to a commensurate extent.

On the 21st of June, Mr. Conder, M.Inst.C.E., gave evidence as to the cost of transport by railway and by canal in the United Kingdom, in Austria, Belgium, France, Germany, and the United States. It appeared from the tables put in by this witness that canal traffic is effected more cheaply, and that higher charges are in certain cases made for railway transport, in the United Kingdom than in any other part of the world. Mr. Conder stated the length of the canals, navigable rivers, and feeders of river and canal navigation in the United Kingdom at 7,336 miles. The length of the French canals and navigations, open and in course of completion, is, according to this witness, 8,882 miles. The length of the canals of America is not known, but there are more than 84,000 miles of railway in the United States.

THE IMPERIAL PALACE AT STRASBURG.

THE proposal of the German Government to erect a new Imperial Palace in the city of Strasburg led to a lively debate when it was first submitted to the German Parliament; but the plan was ultimately approved, and it is expected that the construction will be commenced in the course of the present year. There was some dissatisfaction with the first design, which had been prepared by an official architect in the employ of the Prussian Ministry of Public Works, Herr Landbauinspector Hermann Eggert. Instead of opening a public competition as had been suggested by Dr. Reichensperger and other members of the Imperial Parliament, the German Government has contented itself with calling upon Herr Eggert to revise and modify some details of his original design. This he has now done to the satisfaction of the Ministry, and he has now been informed that the supervision of the construction of the edifice is entrusted to his care. Herr Eggert had been for several years resident in Strasburg as architect of the new university there. He will remove from Berlin to that city again in order to carry out the new palace. This gentleman has also been entrusted by the Government with the preparation of the special plans and details for the new Great Central Railway Station at Frankfort-on-Main.

MR. W. J. WORTHINGTON, ARCHITECT.

ON the 6th inst. died, at his residence, Fulgarth House, Balham, Mr. W. J. Worthington, of the Adelphi, an architect and surveyor well known to many of the older members of the profession. Originally with Mr. Clutton, he became managing clerk in the office of Messrs. Finden & Lewis, by whose influence he was appointed one of the surveyors of the Union Assurance Office, an appointment he held for a period of twenty-nine years. In architectural practice he was associated with Mr. George Rone Clark and others in some successful competitions, and acted under Professor Lewis as surveyor for the old Panopticon; and one of his last engagements a few days before his death was to visit its ruins, acting in the same capacity for the new Alhambra. His business, which was an extended one, has been transferred to Messrs. Perry & Reed, of the Adelphi, to work for the benefit of his family.

THE DANGERS OF OVERHEAD WIRES.

WE have on more than one occasion of late years called special attention to the great and increasing danger to the public which is caused by the stretching of telegraph and telephone wires above the streets and houses of London and other towns.* From stress of weather no less than from neglect of supervision of erection and maintenance there can be no doubt that these multitudinous wires are likely to become increasingly menacing to the safety of wayfarers in our streets, and it is therefore satisfactory to find that the Government and the local authorities seem to be awakening to a sense of their duty in the matter. Questions have been asked in Parliament on the subject this week, and on Monday last a deputation of representatives from forty vestries of London waited on Sir Charles Dilke at the Local Government Board Office on the question of overhead wires. The deputation having been formally introduced by Mr. Daniel Grant, M.P.,

Sir Arthur Hobhouse said the object of the vestries was twofold,—first, as a body representing the ratepayers they saw the practice of extending overhead wires, which they considered were sure to lead to accidents, and desired to call the attention of the Government to the matter; and secondly, they wished to ascertain who were the responsible parties to control the erection of overhead wires. It was contended by some people that the vestry was answerable, as it was the owner of the soil.

Sir Charles Dilke, in replying, said the view which the Government took on the subject was that the owners of the wires had no greater rights of interfering with the streets than had any member of the public; that they could not, either with or without the consent of the local authority, interfere with the public highway in such a way as to cause obstruction to the public, even though such obstruction was limited to the execution of the work of erection. He said the Government were not prepared to say that in all cases it would be unlawful to carry wires across the street where the permission of the owners of houses had been obtained; but it would be a question of fact in each case whether the wires so suspended were such as to constitute a nuisance, and that would depend on the number of wires, &c., and their length. His view was that the vestries had power to so control the erection of wires, but if after a legal test it was found that they had not such powers, he quite agreed it was necessary that they should obtain them by seeking legislation.

* See "Telegraphy and the Weather," *Builder*, vol. xl., p. 223 (Feb. 19, 1881); and "The Modern Sword of Damocles," vol. xliii., p. 890 (Dec. 23, 1882).

VICTOR EMANUEL COMPETITION.

BY recommendation of the Royal Commission appointed last year to examine the designs of the above, five competitors have been awarded each a gold medal, value 1,000 lire (about 42*l.*), and a diploma of merit. (This, of course, is exclusive of the first prize, taken by M. Nanèt, of Paris, whose design, however, appears not likely to be carried out, a second competition being in progress.) There were over 200 competitors, several submitting more than one design. The names and nationalities of the successful competitors are:—

Mr. Daniel Brade, F.R.I.B.A., Kendal.
Messrs. Trabucco, Ferrario, & Giudini, Italy (*sic*).
Chevalier Enrico Bachetti, Professor of Institute Fine Arts, of Rome.
Sig. Paolo Otto, sculptor, Berlin and Rome.
Sig. Giovanni Monticoli, architect, of Rome.

CHÂLET RESIDENCES: HARROW-ON-THE-HILL.

THIS week we give, as promised, an illustration of the second house now building in the private park of Mr. David Brown.*

The internal arrangements of these houses are Swiss in character, with modern English requirements combined. The architect is Mr. J. T. Walford, of 82, Buckingham Palace-road.

GREAT AYTON CEMETERY LODGE.

THIS lodge is now in course of erection for the Great Ayton-in-Cleveland Burial Board. It is being built in connexion with the new cemetery which has lately been laid out upon property purchased from the executors of the late Mr. John Richardson. The cemetery is inclosed by a dwarf wall of local Ayton Moor stone surmounted by an iron railing, and the lodge is constructed of the same stone in horizontal courses from 6 in. to 3 in. in depth, and lined with slag bricks made by the Cleveland Slag-working Company, Middlesbrough, a cavity being left between the stone facing and brick backing.

The whole of the works in connexion with the cemetery and lodge have been carried out by Mr. Wm. Pearson, builder, Great Ayton, from the designs and under the superintendence of Mr. John W. Alexander, architect, of Stockton-on-Tees and Middlesbrough.

Brewery at Burton-on-Trent.—We may add to the statements given in our last number that the whole of the Dennett concrete arching, of which the principal floors are constructed (as shown by the section), was carried out by Messrs. Dennett & Ingle, of Whitehall.

* See p. 289, *ante*.

THE ARTISANS' ESTATE AT HORNSEY.

WE are enabled this week to give a series of plates illustrating the work now being done towards carrying out the objects of the Artisans', Labourers', and General Dwellings Company, of 34, Great George-street, Westminster, in its endeavours to meet what is probably one of the most pressing and important social questions of the day, viz.,—How best to provide suitable dwellings for the industrial classes.

The extensive nature of the work which this Company has done, and is still doing, towards carrying out its avowed object, is attested from the fact that on two of its finished estates alone, viz., the Shaftesbury and Queen's Park Estates, there have already been erected over three thousand houses, with a revenue of 80,000*l.* per annum, and a capital employed which exceeds a million sterling,—an amount which will probably be nearly doubled during the development of the new estate at Hornsey, which we this week illustrate.

The avowed object above referred to as now being carried out is to provide bright, cheerful, well-arranged, commodious, and healthy self-contained cottage-homes for the industrial classes in separated houses, each having back and front gardens, as distinguished from dwellings in barrack-like flats, the whole built on estates laid out and arranged on the most approved sanitary principles, which are maintained and managed in a way that is likely best to contribute to the comfort and well-being of the tenants.

These objects are so thoroughly in accord with the views constantly advocated for so many years past in this journal, that we trust a detailed account of the scheme for laying out this Company's new estate at Hornsey may prove of general interest to our readers.

The land proposed thus to be developed has an area of about 100 acres; it fronts upon the Green-lanes at Wood Green, adjoining the Green-lanes railway station, and runs back, with a gentle slope, to Lordship-lane in the direction of Tottenham.

A general plan of the estate, showing the arrangement of the roads and houses, is given as one of the illustrations. The main entrance from the Green-lanes runs parallel with the railway to an enclosed oval garden on which it is hoped to erect a church; it then turns and runs through the centre of the estate. This main avenue is 60 ft. wide, the houses being set back 15 ft., so that there is a width of 90 ft. from house to house. The other avenues are 50 ft. and 40 ft. wide, all paths and roads being paved and made up in a substantial manner and also planted, mostly with plane trees. It is hoped to reserve a large open space of nearly five acres as a recreation or garden ground, and other small pieces of spare ground will also be reserved and ornamentally planted.

The drainage of the estate has to be arranged on the dual system, the rain and surface-water being kept separate from the sewage. No drains run through the houses, back drains, with intercepting manholes, specially ventilated, being provided to all terraces. This system of ventilation of sewers has specially been considered, and, on the recommendation of Mr. W. A. H. De Pape, the engineer and surveyor to the Tottenham Local Board, the usual ventilating openings in the roads have been arranged to act simply as inlet ventilators, the sewers having at short distances apart specially designed valves and upcast ventilation shafts carried above the houses.

In laying out the estate, care has been taken that all houses are set well back from the road, all having front gardens, and the objectionable practice of bringing the corner houses out to pavement line of the return road is in all cases avoided, the corner houses of the terraces being set back, and specially designed and planned so as to form an architectural adornment to the terrace of which it forms a part.

There will be about 2,600 houses and shops built on this estate, mostly of five different classes, as shown in the plans given.

The first-class houses are built on plots, having a frontage of about 16 ft. wide and 85 ft. deep, with a floor area of about 1,065 ft. on both floors, containing eight rooms, including the scullery. Each house is provided with two sitting-rooms, kitchen, wash-house, and four bedrooms, also a back entrance, with coal-cellar, larder, washing-copper, and water-closet entered from the outside, as well as an additional water-closet on the chamber floor. It is proposed to let the houses at a rental of from 11s. to 11s. 6d. per week, including all rates and taxes, which are paid by the company.

Although in the illustration these houses are shown with no water-closet on the first-floor, yet in the greater number they are provided, and in such cases the back rooms are fitted up as kitchens and sculleries complete, so that they may accommodate two families if required.

The second-class houses are built on plots having a frontage of about 15 ft. 6 in. by a depth of 80 ft. The floor area is 936 ft., containing seven rooms, there being only three bedrooms on the first floor. The other accommodation is similar to that last described, except that there is no upstairs water-closet. The weekly rental of these houses will be about 10s. per week.

The third-class houses are built on plots having a frontage of 15 ft. by a depth of about 70 ft., and contain a floor area of about 800 ft., containing six rooms, three being bedrooms. The weekly rental of these houses will be about 9s. per week.

The fourth-class houses are built on plots having frontages of about 14 ft. 6 in. by a depth of about 70 ft., with a floor area of 660 ft., containing five rooms, there being two bedrooms on the first floor. The rentals of these houses will be about 7s. 6d. per week.

The fifth-class houses are built on plots having a frontage of 13 ft., by a depth of 60 ft. The floor area is about 470 ft., containing a front living-room, with kitchen and small wash-house behind, with two bedrooms over. The rental of these houses will be about 6s. per week.

It is proposed that by far the largest number of houses built should be of the smaller class in order to encourage the industrial classes in the effort to avail themselves of houses at a rental which will not make it necessary to take in lodgers.

In the general planning of these houses the company does not, as will be seen from the plates, profess to show any specially new arrangement, the type, with the exception of the fifth-class houses, being that which seems to have been universally adopted in all town and suburban terrace dwellings, as giving the greatest accommodation at the cheapest rate; where, however, any special requirement has to be met, as, for instance, in the case of shallow, corner, and other irregularly-shaped plots, the architect has availed himself of the opportunity to design plans of almost every variety of arrangement; but for the general terrace plans the Board has not found it practicable to adopt a more convenient and economical plan than that shown.

We give a general view of the terraces of the first and second class houses, as will be seen. A feature in the design is made of the corner houses; and with a view of breaking up the monotony of the long lines which terraces in streets produce, specially designed features are introduced at intervals so as to break up and improve the sky-line of the buildings; advantage is also taken of these features to improve the accommodation of the houses, so that a return may be obtained for the extra outlay by an increased rent, which is readily obtained in such cases.

The houses are all built with a layer of concrete over the whole area of the buildings; the walls are of brickwork,—the party-walls being hollow to prevent the passage of sound between the tenements; slate and cement damp-proof courses are used; the walls are faced with red and yellow bricks, with terra-cotta cills and flower-guards; the roofs are mostly slated, but to give variety many are tiled; the whole being built with the best materials and designed to have a bright and cheerful appearance. The space under the ground floor is specially ventilated, as are also all the rooms. There is constant water supply,—there being no cisterns except the water-waste preventers to the water-closets. The sanitary arrangements are of approved yet simple character, all waste and other pipes being discharged over open, trapped, yard gullies.

The general requirements of the tenants, as we are told, will not be lost sight of, for, as before indicated, plots will be reserved for places of worship, schools, &c., and a building for public meetings is about to be built in a convenient position on the estate, besides a large hall to contain about 1,000 people. This will contain sets of committee and club rooms, also a coffee-tavern and other conveniences. In certain parts of the estate, stables, workshops, and laundries will be erected, and a due proportion of shops, sufficient for the requirements of the tenants, will be built.

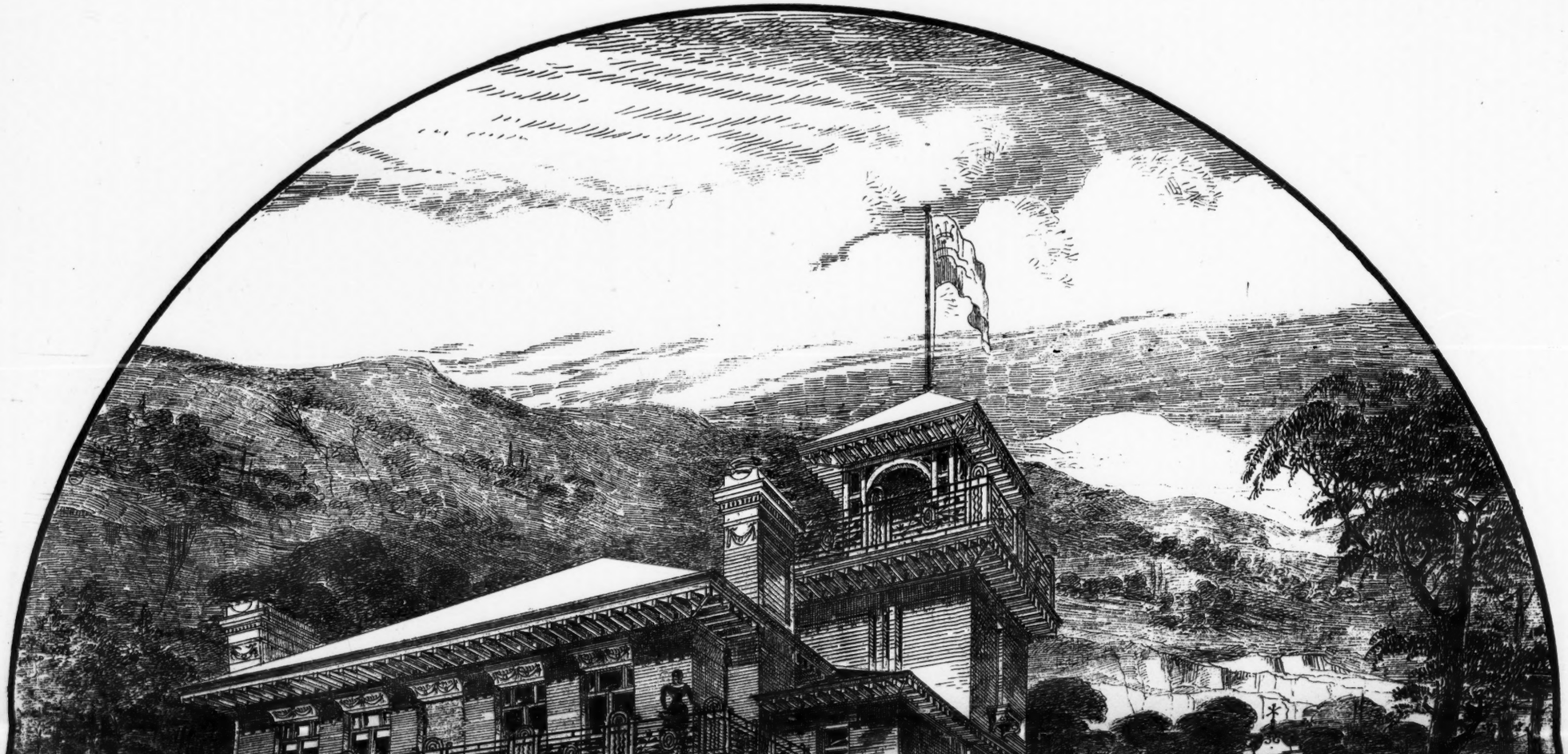
Although the Board does not think it advisable to interfere directly with the conduct of any of the societies that spring up on such an estate, yet it is always desirous of helping forward any good work doing by the tenants on its properties. With this object it gives prizes to the different horticultural and window-gardening societies on the estates, and claims to be always seeking to help those associations which promote thrift and are calculated to teach its tenants to help themselves. With this object, also, it will not allow any public-houses or pawnbrokers' shops on its estates, and it thus endeavours to induce the most quiet and provident portion of the industrial classes to occupy its houses.

About one-fourth of the roads, &c., are now laid out. Large workshops and drying and store sheds have been erected, and about 400 houses are at the present time being built. The whole of the works and buildings connected with this estate have been designed by the company's architect, Mr. Rowland Plumbe, of No. 13, Fitzroy-square, under whose superintendence, and with the close supervision of the vice-chairman, Mr. R. E. Farrant, and a committee of the Board, the works are being rapidly carried out.

THE ORIENTAL MUSEUM, VIENNA.

SINCE the time when, in the Oriental Section of the Vienna International Exhibition (1873), a vast variety of exquisite and unique objects of Eastern art was brought before the people of Austria, the favour with which its products were regarded has been constantly on the increase. That exhibition is a memory of the past, but its fruits have been preserved. One of its results is the establishment of an Oriental Museum, placed under the superintendence of Herr von Skala. In its rooms the precious art products of the East in its widest sense,—comprising in that term the countries from Bosnia to Japan and China,—have been stored by expert hands, and offer, in their completeness, a rare collection of its kind. Few who pass the buildings of the Vienna Exchange have a conception of the amount of art and taste of two continents which is collected in the Oriental Museum. And yet a visit to the museum would well repay the inquirer. Visitors to the late Trieste Exhibition will remember with pleasure the room exhibited by the Oriental Museum, which was arranged by Herr Charlemont, and caused the admiration of art critics. That exhibition, together with the influence exercised by the new museum, has been of great benefit to Austrian trade and industry, has opened up new channels of commerce, and has favoured production. Lately an arrangement was made, for which the public are indebted to the efforts of the superintendent, by which the collections of the Crown Prince Randolph and an unknown noble patron were liberally placed at the disposal of the museum authorities. Herr Hugo Charlemont has thereby been enabled to fit up and completely furnish four rooms, which have now been thrown open for public inspection. The wonders of Arabian, Caucasian, Indian, Chinese, and Japanese art have been combined in a magnificent *ensemble*, delighting the eye and charming the mind. Our illustration represents the fourth room of the Oriental Museum. In this space, perhaps the most beautiful of the series, the decorative talent of Herr Charlemont has found ample scope for display. At the same time, it must be stated that all the resources of Eastern flora and fauna were placed at the decorator's disposal, and he has made full use of them.

Bristol and Gloucestershire Archæological Society.—At a meeting of the Council of this Society, held at Bath, it was decided to hold the annual meeting of the Society at that place on Tuesday, July 31st, and the two following days. Mr. E. Stafford Howard, M.P., will be the president for the next year. The programme for the annual meeting will include the following excursions:—On the 31st, to Roman Bath; August 1, Sodbury, Dyrham, and Lansdown; 2nd, Thornbury and Iron Acton. It is anticipated that Dr. E. A. Freeman, Professor Earle, and the Rev. Prebendary Scarth will attend the meeting, and will be amongst the readers of papers.

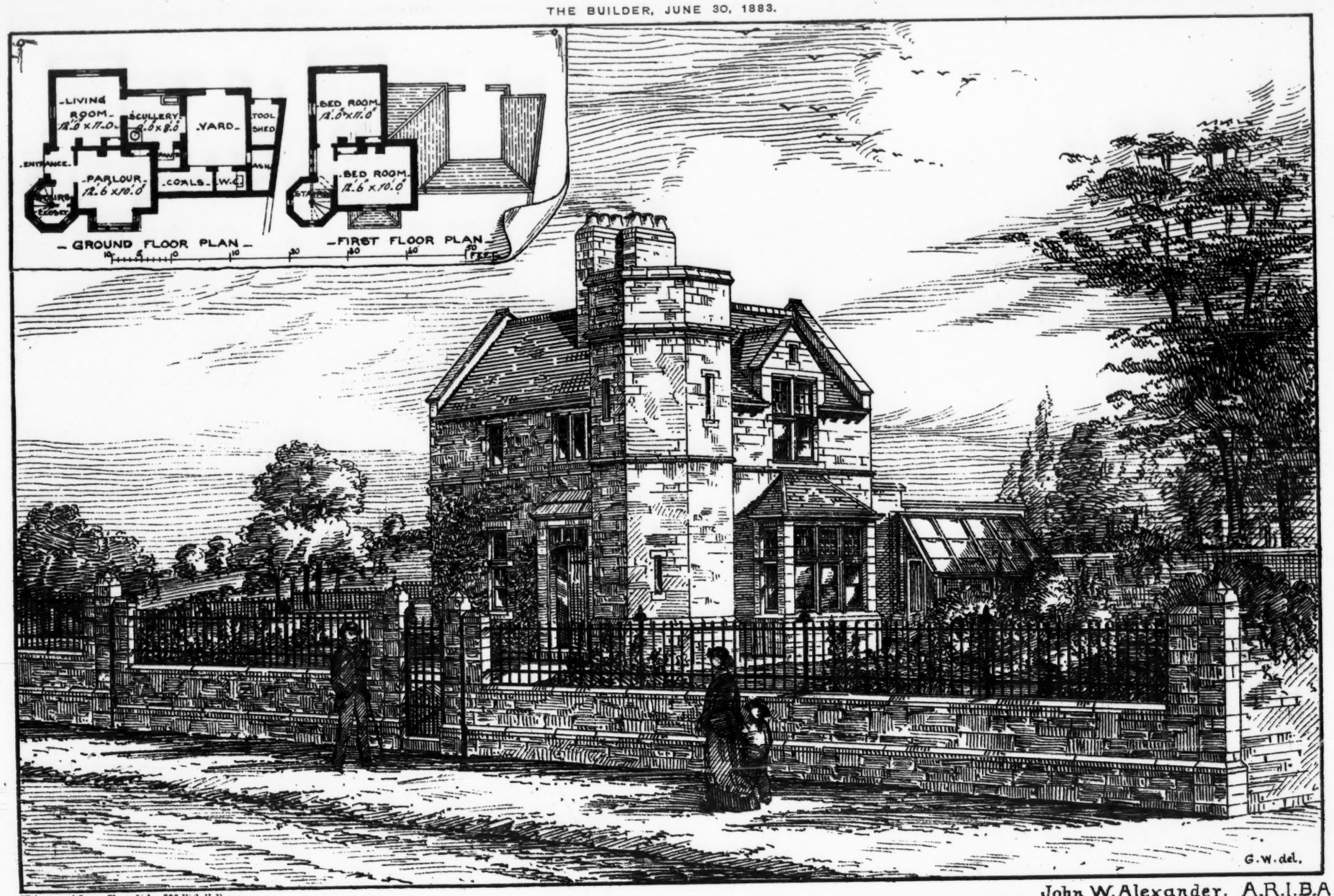


Whitman & Bass. Photo-Litho

Wyman & Sons, Printers.

CHALET RESIDENCE HARROW PARK FOR DAVID BROWN, ESQ.

T. Willard Hoof
32 Buckingham Palace R.d



Whiteman & Bass, *Photo-Litho.* 236, High Holborn.

LODGE TO GREAT AYTON-IN-CLEVELAND CEMETERY

John W. Alexander. A.R.I.B.A. Architect.

TERRACE OF FIRST-CLASS HOUSES.

TERRACE OF SECOND-CLASS HOUSES

C.F.Kell, Photo-Litho. Castle St Holborn.

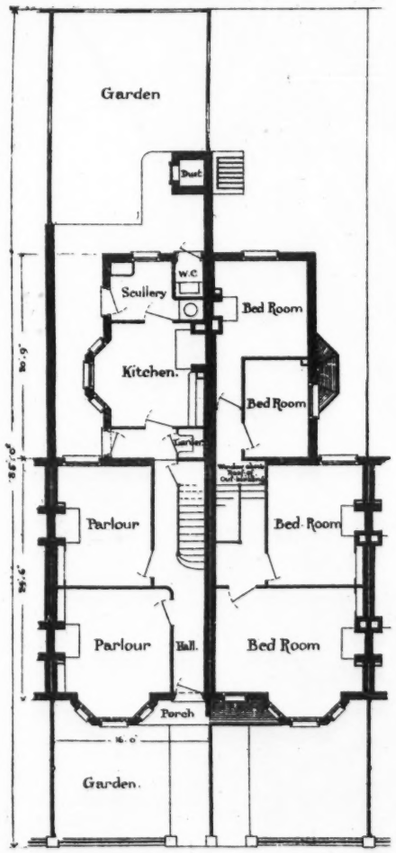
Wyman & Sons, Printers, Gt Queen St.

ARTISANS', LABOURERS', AND GENERAL DWELLINGS ESTATE AT HORNSEY.—MR. ROWLAND PLUMBE, ARCHITECT.

The Artizans', Labourers', & General Dwellings Estate at HORNSEY.

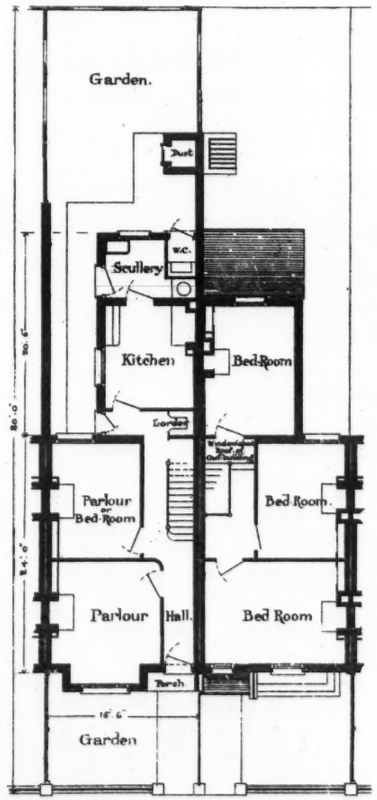
MR. ROWLAND PLUMBE, ARCHITECT.

First Class House.



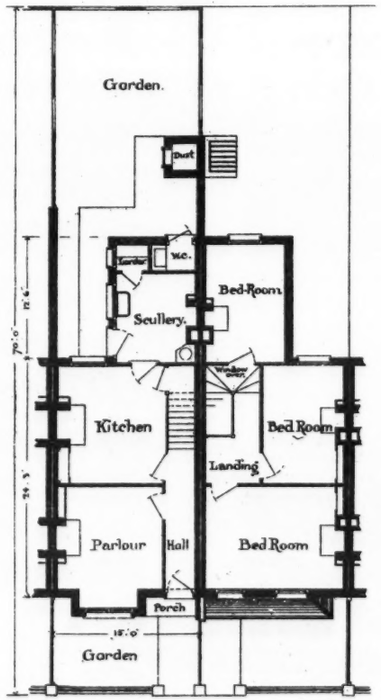
Ground Plan — First Floor Plan

Second Class House.



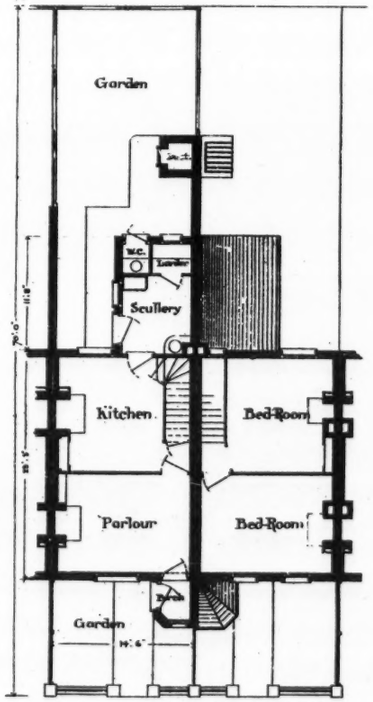
Ground Plan — First Floor Plan

Third Class House.



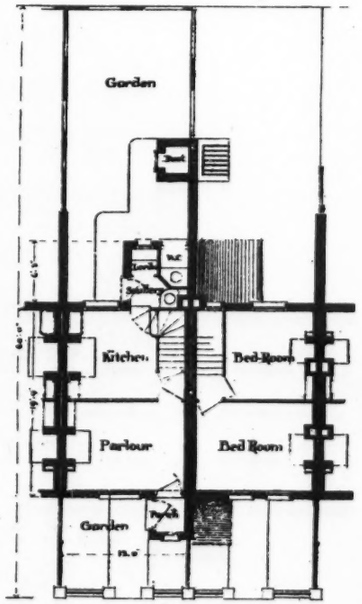
Ground Plan — First Floor Plan

Fourth Class House.



Ground Plan — First Floor Plan.

Fifth Class House.



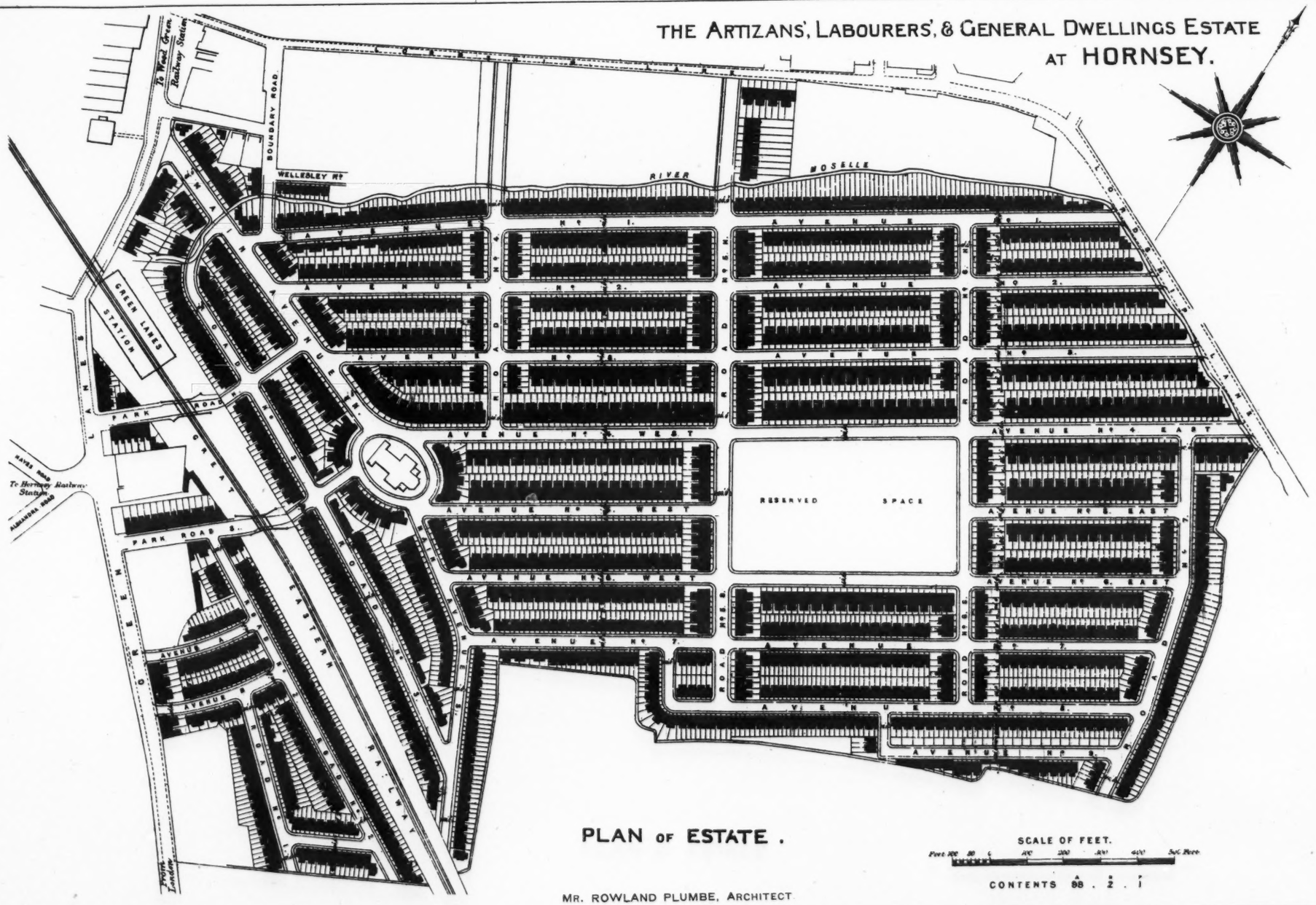
Ground Plan — First Floor Plan

Scale of Feet.

C.F. Kell, Photo-Litho. Castle St Holborn.

Wyman & Sons, Printers, Gt Queen St.

THE ARTIZANS', LABOURERS', & GENERAL DWELLINGS ESTATE AT HORNSEY.



PLAN OF ESTATE.

SCALE OF FEET.

Feet 100 80 0 100 200 300 400 500 Feet.

CONTENTS A 88 . 2 . 1

MR. ROWLAND PLUMBE, ARCHITECT.

C.F.Kell, Photo-Litho. Castle St Holborn, London, E.C.

Wyman & Sons, Printers, Gt Queen St.

A ROOM OF THE ORIENTA

IENTAL MUSEUM, VIENNA.

THE SITE FOR THE PROPOSED CATHEDRAL FOR LIVERPOOL.

THE following is the report prepared by the special sub-committee giving particulars of the available sites for the proposed new cathedral :—

"The special sub-committee to whom you entrusted the duty of collecting facts bearing on the subject of a site for the proposed cathedral have applied themselves to the task with earnestness, and, they venture to hope, with some measure of success. In their investigation they were materially assisted by Mr. Shelmerdine, the borough surveyor, and by Sir James Picton. They had also the advantage of the knowledge possessed of land and buildings by Colonel Wyatt and Mr. Hale, and a letter of suggestions from Mr. Lyster, of the Dock office. To all these gentlemen, and to others who rendered valuable assistance, they beg to tender their best thanks.

The first point of importance was one in which Sir James Picton and Mr. Shelmerdine thoroughly concurred, viz., that the area sought for should not comprise less than 10,000 yards ; and that the length of the edifice from east to west should not be less than 300 ft. Other considerations were not forgotten, *e.g.*, that the situation should be public and central, and that the building should, if possible, be open to view on at least three sides.

But a very important element in the consideration of every site suggested was its probable cost, in case it required to be purchased in whole or in part. It was stated that land covered with buildings could not be procured for less than from 8*l.* to 10*l.* per yard ; while in some instances that amount would be nearly doubled. Land which is not covered by buildings is very rare within the city, or of limited extent ; so that a sufficient one could only be found at a considerable distance from the present centre. It was hoped that some of the churchyards of the town, now practically disused, might have served the purpose ; but it has been found that only one possesses the requisite space.

Whatever may be the site selected, due attention must be paid to its probable condition in the future, for one might be deteriorated by the class of buildings which would rise around it, while another might be improved in an equal or greater degree ; so that even when a preference is given to a few sites,—say two or three,—the public must not regard their present condition as a correct indication of what any of them will be, even a few years hence.

The number of situations suggested as suitable have been about twenty in all, but some of them did not require detailed consideration. So many as fourteen, however, have been examined with great care, and a table compiled from Mr. Shelmerdine's plans and private information, contains details respecting each."

As a supplement to the report, further information is given by Mr. Shelmerdine, who remarks upon the various sites named. We quote a few passages from his remarks with reference to some of the most likely sites :—

"*St. John's Churchyard.*—This site has a total area of about 15,300 square yards, and from east to west an extreme length of about 430 ft. The present church was erected under an Act of Parliament obtained in 1762 ; it was not consecrated, however, until 1783. There are some 2,572 gravestones, and in the event of the cathedral being erected here about one-half of these would have to be interfered with. As regards the area, it would be quite practicable to erect an edifice here with a length from east to west of from 300 ft. to 390 ft. It is to be mentioned, however, that a difficulty might arise with the Corporation as to the advisability of the site being appropriated for the purpose, as it may be considered that it should be reserved in order to leave open the western side of St. George's Hall. There is also the question as to the desirability of erecting a cathedral in such close proximity to buildings in the Classic style of architecture, taking into account that Gothic is the prevailing style for church purposes. It should also be remembered that if erected on this site the edifice would be completely hidden from the most important of the surrounding thoroughfares by St. George's Hall, and also that should the high-level roadway be constructed in William Brown-street, the low-level street between the bridge and the site would be anything but an advantage. The level at the north-eastern corner of the site is about 22 ft. above that at the north-western corner, and the cost of levelling this, should it be considered desirable, would be about 4,500*l.* With regard to the graves, the cost of removing the contents may be set down at about 12*l.* per grave. The subsoil is yellow friable sandstone. The extreme height of St. George's Hall is 115 ft. or thereabout.

St. Luke's Church and Leece-street.—This site would be bounded by Berry-street, Leece-street, Rodney-street, and Bold-place, and have a total area of 9,250 square yards, with a length of about 480 ft. from east to west. To obtain this area it is proposed to utilise the site of St. Luke's Church and yard, containing about 5,450 square yards, and to acquire and add thereto certain properties in Rodney-street and Roscoe-street, covering an area of about 3,800 square yards. It is also proposed to acquire a further plot in Rodney-street, containing about 780 square yards, for the purpose of continuing Bold-place into that street. The property proposed to be acquired consists mainly of valuable dwelling-houses fronting to Rodney-street, and in order to do this it might be necessary to obtain an Act of Parliament. The cost of getting in this property would probably not be less than 20,000*l.* The site would no doubt be a fine one, affording room for a cathedral of imposing dimensions, and the neighbourhood would be all that could be desired. The subsoil is friable sandstone. The difference in the levels is about 27 ft.

George's Dock, &c.—The Corporation have decided not to renew any of the leases of the warehouses in the block fronting what is known as the Goree Piazzas, and as this block will sooner or later be demolished by the filling up of the George's Dock, a magnificent space would be formed. There is, of course, the difficulty as to the loss of accommodation by the Dock Board, but as the exigencies of the traffic must lead shortly to a demand for the filling up of the dock, it is just possible that, in view of this, upon proper representations being made, the Board might consent to anticipate the actual necessity in favour of such an object as that which the committee have in view. Assuming the baths to be removed, and the small basin at present in rear of the stage to be filled up as part of the arrangement, the area available between the buildings at the bottom of Water-street, &c., and the river would be more than sufficient for the cathedral proper, and in every respect suitable, being easy of access from all parts of Liverpool, and from the Cheshire side, and, in fact, situate at the point of the city even now traversed by the great bulk of visitors. For a fine architectural effect probably this site cannot be surpassed, and being situate upon the margin of the river (and at the only point where practically the public have direct access to it), it would be a popular one, and one that in all probability would find favour with the section of the public which may be expected to subscribe towards the erection of the edifice."

SILOS AND ENSILAGE.

THE construction of silos or receptacles for the storage of crops is a subject upon which much has been said of late years, and reference has been made to it in our own columns on more than one occasion. Inasmuch as all circumstances affecting the supply of green fodder are of interest to horse-owners as well as to dairy-farmers, we select from a special account in the *Chester Chronicle* some particulars of filling the new silos at Horseley-lane Dairy Farm, near Peckforton Castle, which have been constructed by Lord Tollemache, by way of experiment, for the benefit of his tenantry. These silos, which are not pits, are four in number, and have been formed out of what was originally a cart-shed and root storage house. The front of this was divided into four bays by five stone pillars. The spaces between the pillars have been built up with a brick wall some 14 in. thick, with a door for each silo. This door is cased inside with tin, painted, and is strengthened outside by means of iron cross-bars and wedges to resist the pressure of the material in the silo. The size of each silo is given as follows :—No. 1 silo, size 1,402 cubic feet ; No. 2 silo, size 1,402 cubic feet ; No. 3 silo, size 1,402 cubic feet ; No. 4 silo, size 2,091 cubic feet ; size of all four silos, 6,297 cubic feet, containing, at 42 lb. of ensilage to a cubic foot, 2,361 cwt., or 118 tons 1 cwt. of ensilage. Roughly speaking, for the writer did not measure them, the first three silos appeared to be about 13 ft. square by about 8 ft. high,—at least, as to the part to be used for ensilage. Of course, there was considerable space above that, in which, on stout shelves supported by brackets, were supported in each silo no fewer than forty-two boxes filled with stones, and weighing 1¼ cwt. each, thus giving a total available weight for each silo of 3 tons 3 cwt. "The ensilage, when the silos are filled with it, will be covered with wooden shutters, 6 ft. long and 3 ft. wide. The shutters will then be covered with 6 in. or 8 in. of bran, to exclude the air, and on the bran will be placed the weights. In two months or so the weights, shutters, and bran will be removed to enable the silos to be filled up, owing to the sinking which will have taken place in the ensilage. Afterwards the shutters, weights, and bran will be replaced, and left until the ensilage is required for fodder. The ensilage will then be sufficiently solid to be cut with a hay-stack knife." (The matter quoted is from a circular which Lord Tollemache has had struck off for the information of his tenantry and other inquirers.) The boxes filled with stones above mentioned, being on shelves high up, are in a handy position to be lowered on to the shutters by means of a chain and pulleys running on rails fastened to the roof timbers, access from one side to another being gained by openings made in the upper part of the dividing walls and also in the upper part of the end walls. The interior of each silo is covered with about 1 in. of concrete, and the tile floors are also thinly coated with concrete to make the joints good and keep out the damp. Horizontal lines are painted at intervals on the concrete to mark the level which has been reached, or show the sinkage. They are, besides, serviceable in keeping the work level.

The morning was rather unfavourable for the operation of filling the first silo, as some rain had fallen the previous night, and the weather being damp and hazy the grass had not dried. It is laid down by the authorities that grass ought not to be cut for ensilage when it rains, or when the grass is very wet from rain water, as it is important to preserve as much as possible the sap of the grass from being mixed with rain water ; but it is also said "it may be cut or carried two or three hours after it has rained." Accordingly, operations were commenced by mowing the long, rank grass in the Orchard, this grass being advisedly selected for the purpose, as well as some other grass of a rank character, grown on land flooded by sewage in the vicinity of the dairy farm. As fast as it was mown the grass was brought in carts to a very large chaff-cutter,—we believe the largest size made by Messrs. Richmond & Chandler,—the mouth of which is 14½ in. across. This chaff-cutter, driven by steam, cut the grass sufficiently fast to keep one man constantly employed in packing the grass on to a travelling feeder, and two others shovelling the chopped grass away as fast as it was cut, with large wooden toothed shovels. Two carts were kept going as fast as they could, carrying the chopped grass to the silo, two men with each cart shovelling the chopped grass through the openings beneath the long shutters placed just beneath the eaves of the silos. The carts carrying the cut grass are boarded up to prevent the cut grass blowing about. Undoubtedly it would be much more convenient to have the chaff-cutter on the floor above the silos, so as to avoid the cartage of the cut grass, but his lordship has preferred to utilise a spare building as it stood for the first experiment, and not to enter into the construction of a modern silo, his object being, in the first instance, merely to show his tenantry the value of ensilage as food for dairy stock, and to demonstrate it in a way which is within the means of all of them. All of them have barns, whereas he had none at the dairy. His lordship, who was present superintending the operation of filling the silo, stated that when he commenced the management of the estate, at the age of twenty-one, he studiously avoided the creation of what is called a home farm or model farm, as he found that on so many estates such a farm engrossed the whole attention of the landlord. He preferred, therefore, to co-operate with his tenants in the improvement of their farms for their benefit and that of the estate. To resume the account of the work going on in the filling of the silo. The work was begun by wheeling the cut grass in large barrows made for the purpose with boarded sides standing some 4 ft. in height. These were wheeled in through the silo doors on the ground level, as long as that could be conveniently done, a kind of stack being formed inside the silo, but care was taken not to give this stack a regular upright side, as the result would have been the formation of an air space, when the silo was afterwards filled in. On the contrary, an irregular sloping surface was formed, and when the door was at last closed and the cut grass was pitched in from the carts through the shuttered opening below the eaves, the grass coming in was well rammed against this sloping side and made level. Three men were at work in the silo, all wearing smooth-soled wooden clogs, stamping the grass down, two of them also using wooden rammers and the third sprinkling coarse salt out of a tin dredger with half-inch holes. The quantity of salt is 2 lb. to every half cwt., this having been found in Lord Walsingham's silos at Merton to be about the right proportion.

Lord Tollemache stated that he hopes where he has hitherto produced three tons of hay per acre to produce eight tons of ensilage, and he is convinced that the latter is twice as nutritious as an equal quantity of hay, on account of the natural juices of the grass being preserved

His Lordship has made personal inspection of the system pursued at Lord Walsingham's silos, and says that when he went there he expected to find a disagreeable smell of decomposed vegetable matter, instead of which there was a very sweet aroma. As to the cost, he was informed that one gentleman in Essex had maintained the possibility of constructing a silo for 30*l.* by simply digging a hole in the ground of the size of 12 cubic feet, concreting the bottom and sides, and covering it with a sort of dome, with a hole in the middle for a man to get through. The advantage which his lordship expects to derive in his own case he states as follows:—He lives in Suffolk and in London part of the year, but he is in Cheshire three or four months, and during that time some 80 or 90 tons of hay are used for the horses and other stock. That 80 or 90 tons of hay come off two mowing fields of the same size—about 24 or 25 acres,—and he believes that by means of the system of ensilage he shall be able to answer the same purpose with one of these fields, and have the other available for another purpose. Furthermore, his lordship has on his estate some 250 or 260 cottagers, and each one of these cottagers keeps a cow. He looked forward to these cottagers deriving great benefit from the system of ensilage applied in some simple form.

BERKS ARCHÆOLOGICAL AND ARCHITECTURAL SOCIETY.

THIS society had its first excursion for the present season on the 21st inst., when the following places were visited, — Faringdon, Great Coxwell, Coleshill, and Fairford.

Arriving at Faringdon, the ancient parish church was visited, the Rev. W. E. Chapman, the vicar, meeting the members at the entrance. Mr. Chapman read a paper on the church. He said there were few in the diocese of Oxford, and not many in England, that surpassed it in points of interest to the student of Mediæval art. Of Norman work in its purity there was but one specimen left in the church, viz., the north door to the nave (now disused). The most prominent features in the door were the peculiarity of the mouldings on the joints, the various patterns, and the wood moulding; the date of the door was about 1070, the time of William the Conqueror. A large portion of the church was of the semi-Norman style, passing into Early English, about 1180, time of Henry II. The mixture of Norman outline and Early English detail in the nave arches rendered that portion of the building especially valuable to the student of architectural chronology. The most beautiful feature of the church was the lower stage of the tower as seen in the interior; the four great piers supporting the tower were lined with bundles of semi-cylindrical shafts, each finished by a carved capital of elegant and varied form. The chancel, which dated from about 1200, was remarkable for its great length and extreme simplicity, and in the sedilia the sculptor had been lavish of his art. In the Unton Chapel there were several monuments worthy of examination. The Perpendicular portion of the sacred edifice, the west window of the nave, and the Pye Chapel, or north aisle to the chancel, were next dealt with, the latter of which (added since the Reformation) contributed much to the beauty of the general effect.

At Faringdon House, Mr. D. Bennett, the owner, received the visitors, and the Rev. J. M. Guilding read a paper on the Manor of Great Faringdon, in the course of which he said few places in Berkshire could trace their history from so remote a period as the ancient town of Farringdon. During the Saxon period the kings had a palace there, in which Edward the Elder died in 925, and in the stormy reign of Stephen the town seemed to have played an important part in the Civil War between that monarch and the Empress Matilda. In the year 1144 the Queen's half-brother, Robert Earl of Gloucester, built a castle at Faringdon, which he fortified and defended against King Stephen; but, after a close siege of four days, want of provisions compelled him to surrender, and it was taken and razed to the ground. He (Mr. Guilding) was inclined to think that Faringdon Clump was the site of the old Norman castle. In the reign of Henry III. they had the first charter on record relating to the town, the date being 1218; it granted a market on Mondays to the Abbot Beaulieu, but by the charter of 1313 the market day was changed to Wednesday. Mr. Guilding traced several memorable events which occurred in the town (including battles) from the time of King Richard II. down to a recent period, and gave a history of the ancient Manor House of Faringdon and of the various possessors of it, some of whom were distinguished persons.

Carriages being taken, a pleasant drive brought the party to Great Coxwell, where the celebrated Abbot's Barn, situated on the farm of Mr. William Gerring (whose family has in a direct line occupied the land for 325 years), was inspected. Mr. Rutland gave a very concise history of the barn, which measures 152 ft. long and 40 ft. wide, the walls being 4 ft. thick. The mouldings and corbels show it belonged to the Decorated period. The original roof remains, with plain open timbers, carried partly on two rows of massive oak pillars resting on stone plinths. A cursory glance at the building was made, after which Badbury Hill was ascended. The Hon. Sec. gave a brief description of a circular camp, 600 ft. in diameter, with a very wide ditch around it, and in which some years ago human bones were found, it being situated on the turnpike-road leading from Faringdon to Highworth.

Coleshill House, the seat of the Earl of Radnor, was the next point of interest, and as his lordship had kindly thrown open the mansion for the inspection of the party, the permission was taken advantage of, and the principal rooms, the pictures, &c., were hurriedly scanned, the richly-carved staircase, and the beautifully-moulded ceilings being greatly admired.

Mr. C. S. Smith read an able paper in the hall on Inigo Jones (the architect of Coleshill House, which was built in 1650) and his influence on English architecture.

Quitting the mansion, the visitors repaired to Coleshill Church, passing on their way the village cross and steps. The village of Coleshill is marked by the absence of an inn or public-house, the erection of these being prohibited.

The journey was continued through a line of charming country, *viâ* Lechlade, to Fairford, some six or seven miles beyond Coleshill, where the last portion of the programme was carried out,—that of visiting the fine old church. The windows of this church are of world-wide celebrity, and have been fully described and commented on in an earlier volume of the *Builder*.

BIRMINGHAM ARCHÆOLOGISTS AT OXFORD.

ON the 19th inst. the members of the archæological section of the Birmingham and Midland Institute had an excursion to Oxford. Leaving Birmingham early, the party breakfasted at the Randolph Hotel in Oxford, after which they were addressed by Mr. James Parker, who described the earliest known condition of Oxford, when it was a mere fortification of a mound upon the banks of the Thames, as Warwick and Tamworth Castles were the origin of other towns upon the banks of the rivers adjacent. The popular fiction respecting the connexion of Alfred the Great with the city of Oxford was shown to be without any foundation, as there was no proof that Alfred was ever in Oxford at all. No mention was made in his will of having had any property there.

The arrangements of the day differed considerably from those generally observed on similar occasions; for, instead of a rapid run through chapels, halls, colleges, and libraries, in which much was seen, but little understood and appreciated, attention was devoted to a similar number of objects, all of which were seen thoroughly, and, by the explanations of Mr. James Parker and Canon Bright, were placed before their audience in a manner seldom possible. Passing southwards, by the Martyrs' Memorial, St. Mary Magdalene's and St. Michael's Churches, and the north gate to Carfax, Merton College and chapel were first visited. Merton is especially interesting as being one of the oldest colleges in Oxford. The ironwork of the door of the hall, of fourteenth-century work, attracted especial attention. The roof of the chapel was painted as a labour of love by one of the Fellows of the College, whom Mr. Parker said he had often seen, some years ago, working away at it in his blouse. At Christ Church a long stay was made, Canon Bright describing the whole history of this magnificent foundation, from the days of St. Frideswide, about 740, to the days of the present buildings by Cardinal Wolsey, in 1525, which, if the Cardinal had been able to carry out his intention, would have been the greatest academic institution England had ever seen. But the Reformation came, and Christ Church was left unfinished, as it is seen to-day, the cloisters having only the bases of the columns formed on one side, and the stones from which the arches were intended to spring on the other. Passing along the Broad-walk to the river, some of the party rowed to Iffley, about a mile and a half down the river, while others walked, to see that most interesting specimen of Norman architecture, the Church of St. Mary Magdalen. On both sides of the church are Norman doorways, ornamented by columns, the shafts as well as the capitals of which are richly carved. The font is very large, and the basin is supported by three twisted stone pillars, each of a different design. The magnificent yew-tree and the churchyard cross commanded attention. Returning to Christ Church Meadows, the route lay to Magdalen, where the fine view from the bridge was seen. The curious old pulpit of stone, from which, on St. John Baptist's Day, the University sermon was wont to be preached, the whole surroundings being strewn with rushes and decked with bows, in commemoration of St. John preaching in the Wilderness, was pointed out, and the many other objects of antiquarian interest there. The new schools and new college were afterwards visited, and dinner at the Randolph Hotel finished the day's proceedings.

The arrangements for the day were made by Mr. J. A. Cossins, the hon. secretary of the archæological section, to whom, as well as to Mr. Parker and Cannon Bright, votes of thanks were passed at the dinner for their kind attentions to the comfort, enjoyment, and instruction of the party.

PROPOSED SAILORS' HOME AT LEITH.

THE plans have now been completed, and tenders received, for the erection of a Sailors' Home near the west entrance to the Albert Dock at Leith. After consideration, the committee appointed to examine the competitive plans sent in selected those of Mr. Charles S. S. Johnston, architect, George-street, Edinburgh. Considerable alterations have (according to the *Scotsman*) been made on the original plans, and a description of the building, the erection of which will be begun immediately, may now be given. The style of architecture is old Scottish Baronial, and the Home will be erected on a site granted by the Dock Commissioners at a nominal rental at the corner of Tower-street and Tower-place.

The principal elevation of the proposed building faces the harbour at Tower-place, where the frontage will be 90 ft. in length. There are four stories and attics. A stone balcony on the level of the first floor runs along the front, while the wall-head and roofs are finished with two rows of dormer windows, with turrets at each corner of the elevation. In the centre is a tower 75 ft. high, with provision for a clock with four illuminated dials, 7 ft. in diameter. The south elevation to Tower-street, which is of the same height, is provided with a balcony and turrets, while the north elevation, facing the docks, consists of a five-storied gable, with two square turrets at the angles, and one side of a covered recreation-court. This court is one story in height, and has an ornamental slated roof, surmounted by an octagonal *flèche* or turret, 25 ft. high. The back elevations are in the same style of masonry as the others. The front entrance, which will be in Tower-place, is flanked on the left by two shops with back saloons, in the rear of which is the seamen's covered recreation-court, 74 ft. by 37 ft., communicating directly with the entrance-hall. On the street floor, the remaining space, both to Tower-place and Tower-street, is laid off as a restaurant or coffee-palace, and behind this the necessary kitchen, scullery, and storage accommodation is provided, together with a wash-house, laundry, coal-house, and a large open kitchen-court. The superintendent's office, and store-room for seamen's effects, are also to be placed on this floor, near the entrance-hall. On the first floor, the superintendent's house and officers' mess-room occupy the space to the left of the tower. A seamen's reading-room, 26 ft. by 19 ft., is beneath the tower, and a recreation-room, 31 ft. by 18 ft., to the right of the tower; while

the remainder of this floor, along Tower-street, is occupied by the seamen's dining-room, 32 ft. by 18 ft., and the kitchen, 22 ft. by 18 ft., with scullery and dinner-service room attached. The recreation-room and dining-room are separated by a folding-door, and can be made into a hall for concerts or other entertainments. On the second floor the officers' recreation-room, 17 ft. by 12 ft., and bed-rooms for the superintendent and servants, are placed to the left of the tower, the corresponding space on the third floor being divided into bed-rooms for nine officers. The remaining space on both flats is divided into two treble, eight double, and thirty-four single-bedded rooms for seamen,—the rooms being separated from each other by plaster partitions extending from floor to ceiling, and all lighted by windows on the outside walls. Altogether there are fifty-six seamen's and nine officers' beds. The attics and upper part of the tower are divided into four large dormitories, which can provide accommodation for upwards of fifty shipwrecked seamen or Naval Reserve men, who may happen to come in large numbers at one time. Separate lavatories are supplied for the various departments on each floor, and bath-rooms, with hot and cold water, on the three upper floors. The principal stair is situated immediately behind the tower, and a private stair is placed near the kitchen, and carried up the whole height of the building, for the use of servants and as a means of escape from the dormitories in case of fire. Both stairs are constructed of stone. The entrance hall and staircase will be heated by hot-water pipes placed in coils, and the remainder of the building, with the exception of the dormitories, will have open fire-places. The ceilings of the street and first floors are each to be 13 ft. high, while those of the second and third floors will be 10 ft., and the attics 9 ft. Owing to there being 26 ft. of sand below the site of the proposed building, the architect has resolved to put a thick layer of concrete, about 7 ft. from the surface of the ground, in order to make a proper foundation. The walls are to be faced with a light brown dressed sandstone and square-dressed white Hailes rubble, while the roofs will be covered with grey-green Elterwater slates and red ridge tiles. Estimates have already been accepted for the structural portion of the work, including pavements to the amount of 7,200*l.*, which, with an allowance of 1,400*l.* for heating, painting, grates, gasfittings, blinds, and other internal fittings, makes a total estimated cost of 8,600*l.*, exclusive of furniture. Provision has been made for extending the building at any future time without interfering with the house now to be erected; accommodation could thus be provided for other sixty-eight seamen, at an estimated extra cost of 1,800*l.*

EXAMINATIONS AT THE SURVEYORS' INSTITUTION.*

THE direct examination (Division V.) for the Fellowship was purposely made almost prohibitory (to discourage evasion of the Associate examination) by requiring of candidates the attainment of the same pass number of marks as in the examinations in Divisions III. and IV. combined. It will be remembered that each of the four classes of technical examination just enumerated had to be subdivided under the three heads of Land Agency, Valuation, and Building. Provision had, therefore, to be made for twelve examinations in all, and there was an obvious advantage in holding the examinations in all similar subjects concurrently in all the divisions.

The system of concurrent examinations may be thus explained:—Taking the four Land-Agency examinations as an example. There will be four sets of Land Agency candidates. The candidates in Division II. get the same papers as those in Division III., and at the same hour, so far as they go, but the latter get an additional paper at the end of their examination. Similarly, the Land Agency candidates in Division V. get the same papers as the Land Agency candidates in Divisions II. and III., so far as they are common, and in addition, and simultaneously with the Land Agency candidates in Division IV., the papers taken by the candidates in the latter division. It is obvious that the examination, in the same papers, of candidates of different ages and different degrees of experience, involves a very careful setting of the papers, both with reference to the number and the difficulty of the questions. Each paper has to be so set as to comprise questions not too difficult to enable the younger candidates to earn sufficient marks in them to pass; and other and more difficult questions (generally involving points of practice), which the students are not required to answer, but are not precluded from answering if they can do so, the two classes of questions being carefully distinguished in a head-note to each paper.

A paper common to the same section in the four examinations carries the same number of marks in each division; but as the pass number to be earned in the same paper rises according to the division in which the candidate is being examined, he is bound to answer a larger number of questions in order to earn the number of marks necessary in his case; and as the maximum marks are distributed among the questions according to relative difficulty, the candidate in any particular class cannot escape attempting to answer those questions which were specially designed for him if he wishes to pass.

Considering that every surveyor is pretty sure to become more or less a specialist in some subject, it is not considered desirable that failure in any one subject should prejudice a candidate's chance of passing, if he can make up the deficiency in other subjects, the only restriction being that candidates for the Associateship are bound to get a certain proportion of marks in the strictly professional subjects as a whole. The subjects of examination in Division IV. (qualifying Associates for the Fellowship), and the same subjects which form a portion of the direct examination for the Fellowship, have been selected as involving the practical experience which cannot be expected of the younger men.

An analysis of the marks awarded in the recent examinations furnishes some instructive results. The maximum attainable marks in Division II. were 1,000; in Division III., 1,200; in Division IV., 1,000; and in Division V., 2,000. Multiplying these maxima by the total number of candidates in the classes to which they respectively apply, and adding the results together, gives a total of 30,000 attainable marks. The proportion of these marks collectively earned by the candidates may, considering the searching character of the examination, fairly be called remarkable. This proportion amounts to 20,216, or more than two-thirds of the marks attainable by all the candidates in all the subjects.

Distributing the 20,216 marks awarded among the several classes of candidates, the following results appear:—

		Earned Marks.	Out of a possible
13	Student candidates for Associateship...	8,762	13,000
5	Non-student ,, ,,	3,636	6,000
1	Qualified Associate for the Fellowship	589	1,000
5	Candidates for the Fellowship.....	7,229	10,000
24		20,216	30,000

Confining ourselves to the two classes of candidates for Associateship, and adding together the marks earned by student and non-student candidates in these classes, we get a total of 12,398 marks earned out of a possible 19,000, or an average of 689 marks per candidate out of an average maximum of 1,056 attainable marks per candidate. Out of the gross total of 12,398 marks earned by student and non-student candidates for the Associateship, 10,696 marks were obtained in the compulsory subjects, and 1,702 marks in the special and scientific subjects, showing that the scientific subjects have been made, as they should be, quite ancillary to the strictly professional subject. The highest number of marks earned by any student candidate for the Associateship was 794 out of 1,000, or 79 per cent. of the attainable marks; the lowest 558, or 56 per cent. The highest marks earned by any non-student candidate for the Associateship were 945 out of 1,200, or 79 per cent. of the attainable marks; the lowest by any successful non-student candidate 710, or 59 per cent. The qualified Associate candidate for the Fellowship obtained 589 marks out of 1,000, or 59 per cent. The highest number of marks earned by any candidate in the direct examination for the Fellowship (Division V.) was 1,609 out of 2,000, or 80 per cent.; the lowest 1,299, or 65 per cent. of the attainable marks.

All the foregoing candidates and all future candidates successful in passing the Professional Examinations will be indicated by an asterisk prefixed to their names in the list of members.

It is not desired to attach too much importance to the legal element of the examinations, and with this object these subjects are marked uniformly lower than the professional subjects, and are, as far as possible, grouped together in one or two papers, as will be seen on referring to the time-table.

The relation of the scientific and the legal elements of the examination to what, for want of a better term, has been called the professional subjects, is a matter of the very highest importance, and great care has been taken to preserve a proper proportion between these various components. It will be instructive, therefore, combining the two groups of candidates for the Associateship, to separate the marks awarded in respect of legal subjects from the total of 10,696 marks left after deducting the special and scientific subjects from the gross total of 12,398 marks earned in the two branches of the Associates' examination. These deductions from the gross total leave 6,980 marks earned in respect of the professional subjects; or 388 marks per candidate in the professional subjects, as compared with 594 per candidate in the professional and legal subjects combined. The proportion borne by the legal subjects is somewhat striking, but the comparison is, in point of fact, illusory. That the proportion of marks earned in the legal subjects is high is undeniable, but a comparison of the maximum marks assigned to the legal as distinguished from the professional subjects shows that the disproportion does not arise from any undue importance given to legal subjects in the scheme of examinations, but from another cause.

Thus, of 3,000 maximum marks assigned to the whole of the subjects in the three sub-divisions of Division II., 450 are assigned to the special subjects, 750 to the legal subjects, and 1,800 to the professional subjects. Similarly, out of 3,600 maximum marks assigned to the whole of the subjects in the three sub-divisions of Division III., 750 are assigned to the special subjects, 750 to the legal subjects, and 2,100 to the professional subjects. Or, putting the two sets of figures together, out of 6,600 maximum marks for the two examinations for the Associateship, 1,200 were apportioned on the scientific subjects; 1,500 on the legal subjects; and 3,900 on the professional subjects. These figures are in the proportion of 18 per cent. for the scientific, 23 per cent. for the legal, and 59 per cent. for the professional subjects. The large number of marks gained in legal subjects is not difficult to account for. For some reason (probably the predominance of book subjects in the section) the Valuation Section of the examinations attracted by far the larger number of candidates; and as legal subjects enter largely, and rightly so, into the composition of this branch of the examinations, it follows that a very large number of marks were earned in them. Distributing the 3,716 marks earned in legal subjects among the sub-divisions in which they were earned, it is found that the large proportion of 2,935 were earned by the Valuation candidates, 615 by the Building candidates, and 166 by the Land Agency candidates.

It is probable that the addition of another practical subject to the Valuation Section would, by rendering it less attractive, tend to equalise, if that be desirable, the number of candidates who select it with the number who select other sections, and, as a consequence, bring the total number of marks earned in legal subjects into closer correspondence with the relative importance actually given to these subjects in the scheme of examinations.

The five candidates in the Direct Examination for the Fellowship (one of the candidates retired at the end of the fourth day) obtained, as previously stated, 7,229 marks out of a possible 10,000,—an average of 1,446 marks per candidate, the minimum pass number being 1,200. It is necessary, in considering this result, to bear in mind that the examination was intended to be prohibitory, both as regards its duration and the difficulty and number of the subjects. The examination of the Fellowship candidates lasted thirty and a half working hours in the Land Agency Section, twenty hours in the Valuation Section, and thirty-two hours in the Building Section; the difference in the number of hours in the Valuation, as compared with the other two sections, being due to the absence of drawing work in that section.

* From a Statement as to the Origin, Arrangement, and Results of the System of Professional Examinations. By J. C. Rogers, secretary.

Experience of the recent examinations tends to show that the number of special and scientific subjects is too large, and might with advantage be reduced so as to leave two subjects appropriate to each section. It is also worth considering whether the whole body of scientific and special subjects might not be transferred to Division IV. Divisions II. and III. appearing to be slightly overweighted, while Division IV. is decidedly underweighted. Very few of the younger men exhibit more than a smattering of knowledge in these subjects, whereas a much fuller and more exact acquaintance with them might be reasonably expected of the older men.

A brief description of the method of conducting the examination in some of the more practical subjects may not be without interest. The foremost place among these subjects is given to the land surveying and levelling examination, which all student and non-student candidates for the Associateship are required to undergo. As a preliminary, all the candidates are required to send in, a fortnight before the examination, a carefully-drawn set of plans and sections, prepared in conformity with certain conditions previously announced. The field-books and level-books are also sent in at the same time, the object being to discover whether the candidate has done the work himself, by subsequently calling upon him to re-plot a portion of it for comparison with the plans previously sent in. It is only fair to say that all the work stood this rather trying test. Some of the best of these plans and drawings have been placed on the walls for the inspection of the meeting.

On the first day of the examinations the two classes of candidates (18 in number) for the Associateship were taken to a common, near Willesden, where a level line of about 20 chains, over undulating ground, had been previously staked out in chain lengths to save measuring. The candidates were started at intervals from the same point, and, after levelling along the line staked out, were required to level round through certain outlying points, and close on the starting-point. The candidates were timed, marks being awarded for rapidity as well as exactness. One of the examiners then levelled over the same ground, to test the accuracy of the sections when plotted the next day. A second day was devoted to the indoor examination of the surveying subjects. Each candidate was supplied with a lithographed plan and required to draw on it suitable construction lines for a survey with the chain only, and was also required to compute with the scale only, and with the computing scale and paper, certain enclosures on the same plan. The candidates were further required to furnish written answers to a number of questions, and in conclusion were practically examined in the use and adjustment of instruments. The candidates in the Building section were, of course, exempted from this latter feature of the examination.

A practical examination also took place in connexion with the subject, "Timber Measuring and Valuing," in the Fellowship examination. This examination was conducted by two Fellows of the Institution, one of them a member of the Council. The candidates were taken to an enclosure in Richmond Park, where twenty trees of different varieties had been previously selected and numbered. They were required to name, measure, and value the trees, and to point out any obvious defects, entering their notes upon forms provided for the purpose.

The examination in land drainage was conducted by requiring each candidate to sketch on a plan, specially prepared for the purpose, the best line for a new outfall drain, through a district indicated, to gain the requisite fall for underdraining it effectually, the ordinary level of the water in the brook adjoining the district being, as shown upon the plan, too high for that purpose. Candidates were also required to answer a number of detailed questions and to sketch on one of the fields on the plan the position of the main drain or drains, and the direction of the minor drains. It may be mentioned that the plan used is part of a very much larger plan, different sections of which will be taken year by year, and which may be varied almost indefinitely by altering the figures representing the surface levels.

The examination in the subject, Metropolitan Buildings Acts, was conducted by furnishing each candidate with a tracing of the ground-plan and section of a dwelling-house, into which were crowded a variety of details representing violations or evasions of the Building Act, and which he was required to detect and remedy. The plan was accompanied by a paper of questions bearing on the same subject.

The candidates in the direct examination for the Fellowship were required to write reports, as to a client, on a set of facts placed before them without previous announcement. The subjects of these reports differed, of course, according to the section in which the candidate offered himself for examination. The object of them was to test the candidate's quickness and self-possession, and his ability to explain himself logically and clearly. The candidates in this branch of the examinations being persons of mature years, prominence was given to its most practical features. With this object the comparatively large number of 350 out of the 2,000 maximum marks was put upon the reports.

CHILDREN'S HOSPITAL FOR BIRKENHEAD.

ON the 21st inst. the Duke of Westminster formally opened the new and important building which has been erected on a site in Woodchurch-road, Oxton, to serve as a Children's Hospital for the Hundred of Wirral, which includes Birkenhead and nearly the whole of the peninsula lying between the rivers Mersey and Dee. The present building in Oxton-road being found too small, and otherwise unsuitable for hospital purposes, the committee decided, on the recommendation of their senior medical officer (Dr. P. M. Braidwood), to erect a new building. Having had designs submitted by several local architects (in public competition), they chose those of Mr. J. Clarke, C.E., of 19, Castle-street, Liverpool; and these, after some modification, have now been carried out. The new hospital is situated on about an acre of land in Woodchurch-road, Oxton, and consists of a central block and one wing, it being intended to erect a second wing when funds permit. Accommodation is provided for forty-two in-patients; an administrative department for double that number of in-patients; and a commodious out-patient department. The style adopted is Gothic, of a domestic type. The building is constructed of Ruabon red bricks, with terra-cotta string courses and enrichments, and red stone dressings. The roof is red-tiled, and the gables are filled in with the Cheshire half-timbered black and white work. The basement floor, which is only half below ground (excavated to the depth of about 6 ft. out of sandstone), and laid with asphalte, is occupied by the kitchen, scullery, butler's pantry, two cook's pantries, two larders, lady superintendent's store-room, and coal-cellar. The arrangements for heating apparatus are also situated on this floor. A lift connects the basement with the floors above. On the ground-floor are the main entrance, with vestibule, enriched with tracery work, and an arched ceiling in terra-cotta; the hall, in red brickwork, with panelling of walnut-wood; corridors of fireproof concrete, leading right and left; and the main staircase. On the corridor to the right of the main entrance is the committee-room, 30 ft. by 16 ft. 6 in. by 12 ft., with lavatory, &c., adjoining. On the left corridor are the house-surgeon's living-room, 16 ft. 6 in. by 14 ft. by 12 ft., and his bedroom, 14 ft. by 12 ft., and a large cupboard for splints; opposite these is a large linen-room, heated with hot-water pipes. At the end of this corridor, and situated in the wing of the building, is No. 1 large ward, for fourteen beds, measuring 56 ft. by 20 ft. by 12 ft. Its floors are of narrow pitch-pine boards, 1½ in. thick, secret-nailed, and wax-polished. The walls inside, up to 4 ft. high, are lined with glazed bricks, while the portions of the wall above this, as well as the ceiling, are coated with cement. This ward is heated by two Galton grates, one at each end, and ventilated by means of Tobin tubes and mica ventilators, communicating with flues leading to a large upcast shaft. The sashes in the windows, and all over the building, are of wrought iron. Speaking-tubes are provided for communication with the officers' rooms. At the further end of the ward are situated the offices, consisting of bath-room, lavatory, sink-room, &c. All through the hospital the ward water-closets have door action, and the sinks and baths are of enamelled earthenware. The ward offices are heated by hot-water pipes, and they are cut off from the ward by a cross lobby. At the nearer end of the ward is the ward kitchen, furnished with a small Leamington range, enamelled sink, and lift from the kitchen, &c. Adjoining this is the out-patient department. The whole of the walls and ceilings are coated with cement. The outer walls of the building are built hollow, in order to secure evenness of temperature. Ascending the main staircase, which is of stone without supports, we come first on the first floor to the nurses' sitting-room, with large bay window, occupying the space above the main doorway and hall. Next to this are the nurses' bedrooms or cubicles over the committee-room, with bathroom, lavatory, &c. Sleeping accommodation is provided for six nurses in separate compartments of one large room. Passing along the corridor to the right, we come to the lady superintendent's sitting and bed rooms, similar in size to, and situate over, the house-surgeon's, with a large cupboard adjoining. These rooms are arranged so that there is only one door in the corridor, which leads into a small lobby, giving access to them, and securing privacy. Over the out-patient department is a ward with eight beds, with bath-room, lavatory, water-closets, &c. Next comes the head nurse's room, ward kitchen, and ward No. 2, similar in size to the ward below (No. 1). The operating-room is also on this floor. On the second or top floor is a separation ward, with four beds, with proper offices adjoining; it is completely isolated from the corridor by its own lobby. There is also a large room not to be used at present, which, with the servants' dormitory, bathroom, &c., completes the accommodation on this floor. Outside is the laundry, it being objectionable to carry on its work in the main building. The whole of the corridors are fireproof, and have been put in by Messrs. Homan & Rodgers. These corridors, together with the nurses' bedrooms, the operating-room, bath-rooms, hall, &c., are heated by hot-water pipes, which, together with all grates, ranges, kitchen appliances, baths, sinks, laundry and gasfittings, bells, speaking-tubes, &c., have been supplied by Messrs. Bennett Bros., of Liverpool; this firm has also made the entrance-gates of wrought iron and bronze, which are presented to the hospital by Mrs. Dowie, of Claughton, in memory of her husband. The painted and stained glass window-panes, illustrating nursery rhymes, which adorn the upper portion of the windows of No. 2 ward, are presented to the hospital by Mr. T. L. Pelling, as were two hall lamps, and the gasfittings of the ground-floor and corridors by other donors. Water-colour paintings have been presented by various members of the Liverpool Society of Water-Colours. Mr. S. Williams, cabinet-maker, Birkenhead, furnishes the wards, bedrooms, &c., with American walnut; and Mr. J. B. Delany, the committee-room, hall, &c., with the like wood. The contractors for the building were Messrs. A. Bleakley & Son, Birkenhead; and the glazed bricks were specially made by Messrs. J. Gilmour & Co. Mr. A. Clarke, brother of the architect, superintended the work. The total cost of the building, including site, has been 10,550*l*.

Proposed National School of Forestry.—A meeting of the committee of the proposed International Forestry Exhibition was held on the 20th inst., in the rooms of the Highland and Agricultural Society, George IV. Bridge, Edinburgh, Dr. Cleghorn presiding. Mr. R. Hutchison, of Carlowrie, reported that, in response to the request forwarded to them, a very large number of noblemen and gentlemen had kindly consented to become patrons of the exhibition. He proceeded to say that the object of the show proposed to be held in Edinburgh next year was to endeavour to make it the starting-point of a national school of forestry, an institution which this country very much required. At present their students intended for work in India had to proceed to schools on the Continent for instruction, whereas there was ample scope for study at home. There could, he thought, be no more fitting occasion than the year in which Edinburgh University celebrated her tercentenary for the holding of a great exhibition, and thus bring before the notice of the public the wealth of our forest products. The authorities of Edinburgh were anxious to have the Arboretum at the Botanic Gardens put in a thoroughly equipped condition, and there was no way in which this could be better advanced than by the holding of such an exhibition. Already a guarantee fund of 700*l*. had been subscribed. The Marquis of Lothian was elected chairman, and a small committee was appointed to select the executive committee.

NEW BUILDINGS IN GEORGE STREET, EDINBURGH.

THE Directors of the Bank of Scotland, consequent on the growing increase of business in the chief branch in the new town, recently acquired the property at the west side of the bank in George-street, and plans having been prepared by Messrs. Kinnear & Peddie, architects, for the erection of more commodious premises, operations are now in progress for the demolition of the old buildings. Designed in the Italian style of architecture, the new buildings will have a frontage to George-street of 66 ft. It is intended that the street floor shall be solely occupied as the bank offices, the cellarage below being set apart for the storage of books, documents, &c., while the two upper flats are to be laid out in suites of chambers. There is also a large building behind, in Meuse-lane, where a two-story erection is to be raised above the basement-floor, and which will be fitted up as chambers of a superior description. The entrance to the bank will be at the west end of the frontage, where there is to be a Doric portico, with coupled columns, carrying an entablature and pediment, on which are carved the bank's arms and supports. Corresponding to these, at the east end of the street-floor will be the entrance to the chambers or offices, and between the two there are three large windows lighting the telling-room and the agent's private room, which measures 18 ft. by 14 ft. These windows are 8 ft. wide and 15 ft. high to the top of the arch, and are divided by Ionic shafts in the centre, with pilasters at the sides, carrying a light entablature at the spring of the arch while the semicircular arch itself is divided by an ornamental carved pilaster. The whole of the street floor is executed externally in rusticated ashlar, and is finished at a height of 27 ft. above the pavement by an enriched cornice. The first-floor has five windows, which are ornamented by three-quarter Corinthian pilasters standing on pedestals, with balusters between and supporting suitable entablature and pediments. The second-floor has smaller windows, finished with moulded architraves. The front of the building is finished with a highly-enriched cornice and carved frieze, the two measuring 6 ft. in height. To the telling-room, as already indicated, the entrance is at the west end, where there is a lobby measuring 15 ft. by 10 ft.; while the telling-room itself measures from back to front 53 ft., its width at the broadest part being 42 ft. and the height 24 ft. Besides the windows to the front, there are five equally large windows at the back. The front portion of the room, however, measures 27 ft. in width, the entrance to the bank and the agent's room projecting somewhat into it, and thus reducing the width. Following the lines of this narrower portion are a row of Corinthian columns continued along the two sides and returning along the back, which, supporting ornamental entablature, brings the ceiling of the central part into a space of 46 ft. by 27 ft. Similar pilasters are placed against the wall, the whole of the pilasters and columns being set upon an ornamental dado. The ceiling of the telling-room will be richly panelled; the floor of the public portion of it will be laid with marble mosaic, the doors, windows, and other woodwork being of wainscot, while the counters and other furnishings will be of mahogany. To the chambers the entrance is by a corridor at the east end of the building, measuring 8 ft. wide, giving access to a staircase 22 ft. by 15 ft. In this section of the building the first floor is laid out in suites of rooms of various sizes, having a corridor 7 ft. wide running down the middle. The upper floor is laid out in a corresponding manner, but the rooms are of smaller dimensions. Above it, looking to the north, is a large house for the bank-porter or office-keeper. Including the Meuse-lane building, which is reached by the corridor above referred to, there are twenty-seven rooms, intended for offices. The cost of the new buildings is estimated at about 13,000*l*.

Some time ago the Scottish Accident Insurance Company (Limited) purchased the tenement, No. 115, George-street, formerly the town residence of the late General Moncreiff, part of which they are about to use as the head offices of the company. The building, which was designed by Robert Adam, the architect of the Register House and University Buildings, was considered one of the best and most highly decorative of the old houses in George-street; and in the alterations necessary to convert it into premises suitable for the new owners, the architects have (according to the *Scotsman*) infused a little of the spirit of the original style of architecture, as far as adaptable to its new uses. The ground-floor was cleared of cross walls, and the partitions of the upper floor having been supported on iron beams, the old front was taken down and a more elaborate one erected in its stead, in keeping with the upper part of the building, which, with the view of making the entire elevation of a more uniform character, has been re-chiselled and restored. The style adopted is Roman Doric, freely treated, and is of such a character as to give individuality to the building. The entrance to the offices is by means of a pedimented portico at the west end, supported by fluted columns with richly-carved capitals. Admission is gained to the upper flats by a similar portico at the east end of the building. Between the porticos are placed the office windows, with fluted three-quarter columns similarly carved. The whole ground front is surmounted by an ornamental balustrade, and the wall head of the building has also received a surmounting balustrade, on which it is intended to place some vases. The cost of the alterations will be about 1,500*l*., and it is expected that the premises will be ready for occupation towards the end of the present month. The architects for the alterations are Messrs. Knox & Hutton, 63, York-place.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,013. W. Ayres, London. Stench-trap for drains, &c. June 18, 1883.

3,015. G. W. Von Nawrocki, Berlin. Rising hinges. (Com. by H. Haltaufderheide, Cassel, Germany.) June 18, 1883.

3,043. W. R. Lake, London. Door-locks. (Com. by MM. Mayer, Langfelden, & Hammerschlag, Vienna.) June 19, 1883.

3,064. J. D. Sprague, London. Latches, bolts, or fastenings for doors, windows, &c. June 20, 1883.

3,081. J. Moyes, Pollockshields. Ventilating sewer-trap. June 21, 1883.

NOTICE TO PROCEED

has been given by the following applicants on the dates named:—

June 19, 1883.

803. W. Mullett, Brierley Hill. Construction of walls for buildings to prevent damp therein. Feb. 14, 1883.

845. H. Tugby, Woodville. Manufacture of pipes for sanitary purposes, &c. Feb. 15, 1883.

905. J. Dunbar, Coalbrookdale. Fire-grates. Feb. 19, 1883.

2,459. T. Hale, Claydon. Domestic fire-escape. May 16, 1883.

June 22, 1883.

900. W. Carrington, Openshaw, and W. H. Bowers, Gorton. Water-heater used in connexion with circulating hot-water pipes for warming buildings, &c. Feb. 19, 1883.

904. B. C. Cross, Leeds. Waste-preventing cisterns. Feb. 19, 1883.

1,294. G. E. Mineard and T. Crapper, London. Ventilating house-drains and warming houses. March 10, 1883.

ABRIDGMENTS OF SPECIFICATIONS,

***Published during the Week ending June* 23, 1883.**

4,491. W. H. Cooper, London. Drip-course bricks. Sept. 20, 1882. Price 2d.

This consists in the dimensions of a course of bricks forming a weathering to all projecting mouldings, &c. (Protection not allowed.)

5,124. A. W. L. Reddie, London. Alarm bells or gongs for doors, &c. (Com. by E. J. Masseron, Paris.) Oct.) 27, 1882. Price 6d.

A mechanical alarm-bell is attached to the door, and a rotating clapper strikes a succession of blows on the bell on the movement of the lock-bolt, or door-handle, &c.

5,132. S. de la G. Williams, Birmingham. Kilns for burning lime and bricks, &c. Oct. 27, 1882. Price 8d.

Two horizontal flues are placed under the length of the chamber, one for gas and the other for air. To these are fitted transverse horizontal flues, leading into vertical flues, terminating in openings in the floor of the chamber. From the top of each chamber a series of flues descend to the air-flue at the bottom of the next chamber. These flues are governed by a damper. The heat is thus led through all the chambers in succession.

5,301. R. G. Hodgetts, Birmingham. Manufacture and ornamentation of metallic bedsteads, &c. Nov. 6, 1882. Price 8d.

The pillars of the bedsteads are formed of metallic fluted tubing, with metallic mounts and screw-caps, and they are ornamented by pieces of glass, china, &c.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

SURVEYORSHIP ITEMS

Southwark. — At a meeting of the St. Saviour's District Board of Works on the 20th inst., the special committee on the subject of the surveyorship reported that they had received forty-two applications for the appointment. After careful consideration of the same, they selected eleven candidates, with ten of whom (one having withdrawn his application) they had an interview, and after further deliberation have reduced the number to the following six, who appeared to be most eligible, namely: F. W. Barratt, assistant surveyor to the Hackney Board of Works; W. G. Forder, assistant surveyor to the Edmonton Local Board of Health; A. J. Henderson, assistant surveyor to the Islington Vestry; T. L. Johnson, Walthamstow, Essex, engineer; G. R. Norrish, 18, Palace-road, Upper Norwood, architect and surveyor; and F. M. Putley, 5, Southampton Buildings, Chancery-lane, architect and surveyor. They recommended that a special meeting of the Board be held for the purpose of appointing one of the said six candidates. Mr. T. F. Rider moved, and Mr. Couchman seconded, the adoption of the report. Dr. Jones moved, as an amendment, that Mr. Greenstreet be re-appointed surveyor for six months. Mr. Ridley seconded. After considerable discussion the amendment was rejected, and the report adopted by 20 votes to 9.

Warwick.—On the 20th inst. the members of the Warwick Volunteer Fire Brigade entertained Mr. T. Broughton (Borough Surveyor), the captain of the brigade, at a dinner at the Nelson Inn, West-street, upon the occasion of his leaving Warwick for an appointment in Yorkshire. The services which Mr. Broughton had rendered to the brigade during his eight years' connexion with it were warmly eulogised.

Chesterfield.—At the last meeting of the Chesterfield Town Council, the committee appointed to consider the duties and the salaries of the borough officials made the following recommendation:—"That the duties of the Sanitary Inspector and Borough Surveyor be discharged by the same person, at a salary of 125*l*. per annum." Alderman Gee moved an amendment against the amalgamation of the offices of Borough Surveyor and Sanitary Inspector. Councillor Lomas seconded the amendment, and it was supported by Councillors Marriott, Wardle, and Booth. On being put to the vote, eight held up their hands in favour of the amendment, and five for the original motion, and the amendment was therefore declared carried, and after some discussion it was agreed that the 125*l*., advertised as the salary proposed to be given to the Borough Surveyor and Sanitary Inspector, should be the salary of the Surveyor. Mr. Walter Stanton, surveyor, Chesterfield, was appointed.

STAINED GLASS.

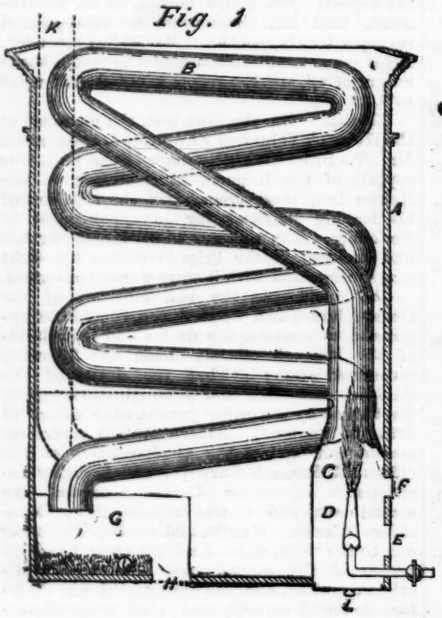
Woodstock.—The rector of Woodstock writes,—"Within the last few years we have been enabled by means of public subscriptions to restore the old historic church of Woodstock, at the cost of between six and seven thousand pounds. We now propose to complete our work by adding a painted east window to the memory of the poet Chaucer, who, in the days when Woodstock was a royal residence, occupied a house (now bearing his name) on the borders of the park." The statement that the poet ever resided at Woodstock is disputed.

Cullingworth.—Two stained-glass windows, to the memory of the late Nancy and John Hartley, of Bent's House, have been erected in the chancel of Cullingworth Church, by Mr. E. H. Hartley, brother of the first and son of the last. The two windows are mainly occupied by the figures, one of the apostle St. Peter and the other of St. John. These figures, painted on a white screen background, stand beneath rich canopies, upon ornamental bases, and with enriched bordures. The firm of Powell Bros., Leeds, executed the work.

IMPROVED AIR-WARMING AND COOLING APPARATUS.*

MESSRS. ROBERT BOYLE & SON, of 64, Holborn Viaduct, have recently effected some important improvements in air-warming and cooling arrangements which we have no doubt will prove of considerable value as a simple, and at the same time economical, means of providing a supply of fresh air at such a temperature as will be both safe and agreeable in all seasons of the year. The air-warmer is intended for warming the fresh-air supply to a building, where hot air, water, or steam pipes are not available. The arrangement consists of a copper or iron pipe, about 1½ in. diameter, placed in an inlet tube, preferably of the form of a bracket. This pipe is made of zigzag shape, so as to cross and re-cross the tube from top to bottom, causing the incoming air to repeatedly impinge upon it in its passage through the tube. At the bottom of the tube an air-tight chamber, so far as the interior of the tube is concerned, is fixed, in which a "Bunsen" burner is placed, the flame of which plays up into one end of the pipe, which is connected with the top of the chamber. The heat travels through the entire length of the pipe, the other end of which may be made to either dip into a condensation-box in the bottom of the tube, or be continued, as shown by dotted lines in the accompanying diagram, up into a flue or extraction-shaft. If the pipe terminates in the box, the vapour is condensed there, and carried off through the outside wall by means of a small pipe, and any products of combustion which may arise are absorbed and rendered innocuous by passing through a loose bed of charcoal, which covers the bottom of the box. The charcoal should be renewed about once a fortnight or month, according to the extent the tube is used. The diagram below (Fig. 1) shows the arrangement, which is explained as follows:—

Fig. 1



A, air inlet tube or bracket made of galvanised iron, and painted, dimensions 24 in. by 16 in. by 6 in. These tubes can be treated ornamentally to harmonise with the decorations of the room, and where necessary, may be placed in chases in the wall. The top of the tube should stand about 5 ft. 9 in. from the floor. B, copper or iron tube, 1½ diameter. C, chamber containing the burner. D, Bunsen burner. E, opening covered with perforated zinc inside of the tube communicating with the chamber for the purpose of supplying air to the burner. F, small hole fitted with sliding-shutter through which the gas is lighted. G, condensation-box. H, opening in the bottom of the box to allow of the circulation being maintained in the heating-pipe. J, pipe for carrying off condensed vapour. K, continuation of the pipe into the flue or extraction shaft. L, movable bottom to the flame-chamber for the purposes of cleaning the tube. Where the tubes are placed against the woodwork all chance of fire may be avoided by fitting them with a double casing or jacket, and filling in the space between the asbestos or other non-conducting material. With this arrangement the air-supply can be raised from a temperature of 30° to 130°, and to show that it is one of the most economical methods of heating in existence it is only necessary to mention that the cost of gas consumed to raise the incoming air from a temperature of 40° to 100° is less than one farthing per hour, this being effected with the air passing through the tube at a velocity of 300 ft. per minute, or 18,000 ft. per hour.

At the Reform Club, where these tubes and heaters in combination with Messrs. Boyle's patent air-pump ventilators have been very successfully applied, a series of experiments were carried out by the patentees in conjunction with the Right Hon. Acton Smee Ayrton, ex-Chief Commissioner of Works, to whose suggestions we may mention *en passant* the patentees are indebted for some important improvements in the apparatus. The result of these tests demonstrated that the apparatus was not only useful for warming the air supply for the purposes of ventilation, but that it might be used as the sole means of heating rooms. On testing the tubes with the anemometer the air was found to be passing in at the rate of 16,000 cubic feet per hour, the dimensions of the tube being 24 in. by 16 in., one-third of which was blocked up with the heating-pipes. It is important to note that these figures compare most favourably with the results obtained by elaborate and expensive arrangements for artificially forcing air into a room by means of water-fans, sprays, &c., which are not only expensive and troublesome to maintain, but, owing to their bulk, constitute an obstruction and eyesore in a room.

The tubes are fitted with regulating-valves and deflecting shields to prevent the air from discolouring the walls. They can also be fitted with an arrangement for filtering, and freeing the incoming air from blacks and dust. They are not expensive, the price of them ranging from 45s. to 100s., according to size and material used.

They are applied to a number of buildings, including the Guildhall, and Lloyd's, Royal Exchange, and have been found to answer exceedingly well.

The great objection to nearly all methods of admitting fresh air is the disagreeable cold draughts they create. The appliance we have described effectually overcomes this, and should therefore be welcomed as a really valuable addition to the list of useful sanitary inventions which are now in use.

Fig. 2

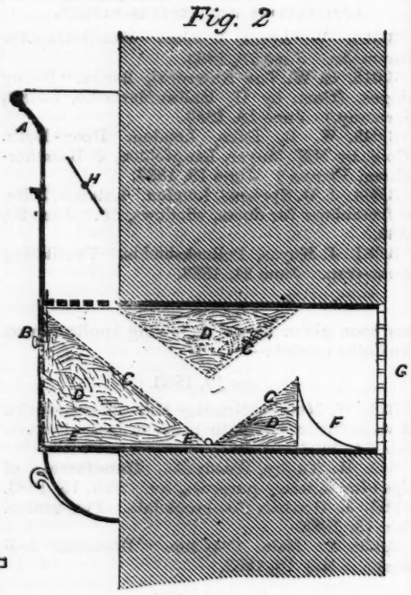


Figure 2 shows the arrangement for cooling the air in hot weather. It consists of an air inlet tube, of bracket form, made of iron. The part which penetrates the hole in the wall has an outer casing, so that a space of about ½ in. is left between, which is packed with a non-conducting substance for the purpose of preventing the heat from the wall penetrating into the interior of the opening and acting upon the blocks of ice which are placed in a movable drawer, and kept in position by means of open galvanised iron or copper wire netting. The front of the drawer is also double, and packed the same as the casing. The outer air entering through the grating is deflected by a metal shield on to the suspended block of ice, and thence on to the ice at the bottom of the drawer, and thence up the tube into the room, it being not only cooled, but purified thoroughly from blacks, dust, &c.

This arrangement, we should say, would prove very acceptable in our fashionable London drawing-rooms during the season.

A, in the diagram, denotes the inlet-tube; B, movable drawer; C C C, wire netting; D D D, ice; E E E, non-conducting packing; F, deflecting plate; G, grating in wall; H, regulating valve.

* This was unavoidably postponed last week.

Crathie.—A monument of Aberdeen granite, to be placed over the grave of the late Mr. John Brown in the parish churchyard of Crathie, is being executed by Messrs. MacDonald, Field, & Co., of Aberdeen, by command of the Queen. It is of simple design, the chief ornamentation being the Scottish thistle on the cornice, which is carved in relief, and a border of oak and ivy.

AWARDS AT THE NATIONAL HEALTH SOCIETY'S EXHIBITION.

AMONG the awards to exhibitors in this exhibition, recently held at Knightsbridge, and noticed by us at some length,* we may name the following:—

In Class II. silver medals were awarded to the Sanitas Company, for Sanitas oil and emulsion; Mr. P. A. Maignen, for "filtre rapide"; F. C. Calvert & Co., for preparations of sulpho-carbolates; and a bronze medal to Jeyes's Sanitary Compounds Company, for sanitary compounds.

In Class III. a silver medal was awarded to Moule's Patent Earth-closet Company, for their earth-closet apparatus; a bronze medal to Messrs. John Bolding & Sons, for their valve closet, with flushing-rim and supply of water to trap of overflow; for their wash-out closets a second bronze medal was given. Mr. O. D. Ward receives a bronze medal for his household hopper closet, and hon. mention for Bean's patent direct-acting valveless waste-preventer. Mr. George Jennings receives a bronze medal for his housemaid's slop-sink, and a second bronze medal for his automatic flushing-cistern; while his patent ball-trap and tip-up lift-out lavatory basins each receive hon. mention. A bronze medal goes to Messrs. Hayward Tyler &Co. for their full-flush valveless closet. The same firm receive hon. mention for shower and douche valves. Mr. D. T. Bostel, of Brighton, obtains hon. mention for his Brighton Excelsior closet. Robert Houghton & Co. receive a bronze medal for their improved gully, with movable side inlet. Mr. Henry Conolly receives a bronze medal for his valve closet with supply of water to trap of overflow. The same exhibitor receives hon. mention for Bellman's patent gully and his noiseless water-waste preventer. Messrs. J. Purnell & Son obtain a bronze medal for a syphon water-waste preventer, and hon. mention for an air-tight manhole door. Mr. A. T. Angell receives hon. mention for his air-tight manhole door, and a second award of like honour for his lip syphon trap. Messrs. Robert Boyle & Son obtain a bronze medal for their air-pump ventilator. Messrs. C. Kite & Co. obtain two bronze medals, one for their improved inlet ventilator, and the second for their chimney-breast outlet ventilator. Messrs. H. W. Cooper & Co. obtain hon. mention for their circular revolving and sliding ventilators in glass. Messrs. Hayward Brothers & Eckstein take a silver medal for Hayward's patent semi-prism reflecting lens pavement lights. Mr. Robert Adams receives a bronze medal for his anti-accident reversible window; and a bronze medal for his fan-light opener. The Albissima Paint Company receive a bronze medal for the Albissima non-poisonous paint. Messrs. Jeffrey & Co. receive a silver medal for cheap artistic wall papers free from arsenic, and a silver medal for wall papers painted in oil colours on lacquered gold ground. Messrs. Morris & Co. obtain a silver medal for their exhibit of washable printed cotton and other cheap and artistic fabrics. Messrs. Woollams & Co. get a silver medal for wall papers free from arsenic; and Messrs. Scott, Cuthbertson, & Co. a bronze medal for goods of the same description. Mr. Henry Carr receives a bronze medal for diagrams showing that wall papers can be produced with as good effect without arsenical colours; and Messrs. Howard & Sons a bronze medal for parquet flooring.

In class IV. the North of England School Furnishing Company obtain a bronze medal for Roth's school seats. Mr. Newton H. Nixen receives a silver medal for his bed-pan cage.

In Class V. the Victoria Stone Co. get a bronze medal for patent stone flooring.

In Class VI. Messrs. Brown & Green obtain a silver medal for their under-feed smoke-consuming apparatus, as applied to kitcheners and register grates. Messrs. W. & S. Deards receive a bronze medal for their Princess Louise stove for heating by hot-water. The Eagle Range and Foundry Co. get a silver medal for their Eagle range. To Messrs. Potter & Sons a bronze medal is awarded for their thermhydric ventilating hot-water open fire-grate. Messrs. H. & C. Davis & Co. receive a bronze medal for their Eclipse griller, and Messrs. Beynon & Cox receive two silver medals and a bronze medal for gas stoves. The Coalbrookdale Co. (Limited) get a bronze medal for the Kyrle grate. Messrs. Richards & Barton's circular-fronted range is awarded hon. mention. The Bisschop gas engine gets a bronze medal, and the General Gas Heating and Lighting Apparatus Company (Limited) for their exhibit of gas cooking stoves, receive a silver medal, and for their artisan gas griller a bronze medal.

* See *Builder*, p. 787, *ante*.

COMPETITIONS.

Brisbane Town-hall Competition.—We wish to direct the attention of our readers to the advertisement of this work which is occasionally appearing in our columns. The premiums offered are 250*l.* and 100*l.*

The Leeman Memorial, York.—A committee meeting was held on the 18th inst. in the Victoria Hall, to examine the models sent in by the four invited competitors, and to decide which should be selected. The chair was taken by the Lord Mayor, and the method of procedure having been discussed and settled, the committee adjourned to the hall, spending a considerable time in comparing notes and in inspecting the models. The method of voting adopted was to cast out the less likely models until the competition was reduced to small dimensions. Ultimately, it came to a vote of 11 for Mr. Milburn and 8 for Mr. Halse. Mr. Alderman Agar then moved, and Mr. C. Sellers seconded, as a substantive resolution, that Mr. Milburn be entrusted with the execution of the work at his tendered price of 700*l.* for a marble figure and a polished granite pedestal. It was carried by 11 votes to 3. On the motion of Mr. Hargrove, it was agreed to vote 10*l.* each to the three unsuccessful competitors towards the expenditure they had incurred.

METROPOLITAN BUILDING ACT.—WHAT IS A BUILDING?

A SUMMONS was taken out under Sec. 41 by the District Surveyor of Clerkenwell, and Part of Islington, against Mr. W. Iron, for neglecting to give notice, in accordance with Sec. 38, of the addition to a workmen's shed next Clerkenwell Vestry-hall. A shed had originally stood on a portion of the site of the present erection; this had been raised 6 in. and re-roofed, and a new extension carried to a fence wall abutting on Garnault-road, the fence wall being raised 2 ft. 6 in. to enclose the end of the building. The whole shed as enlarged was 26 ft. 6 in. in length, 13 ft. 6 in. in width, and about 8 ft. in height. It was built against a brick wall which separated it from a one-story addition to the adjoining building. The roof was of corrugated iron upon T rafters, and carried upon 2½ in. iron columns. The shed was used by the parish as a place of stowage for stones and workmen's tools.

The defendant, who was represented by Mr. Boulton, solicitor, contended that the shed was not a building within the meaning of the Act.

The District Surveyor having called the Magistrate's attention to the various clauses of the Act upon which he relied, the Magistrate asked if he could quote any superior court cases in which the meaning of the term "building" had been defined. After having referred him to the cases of Stephens *v.* Gourley and Knight *v.* Pursell, the summons was adjourned to enable the Magistrate to view the building, which he did on the 7th inst.

The District Surveyor, considering the case of some importance, directed his solicitors to instruct counsel; and accordingly on the 21st of May,—the day to which the summons stood adjourned,—Mr. Redwar, barrister, appeared to support the summons.

The defendant's solicitor objected to this as being irregular, the prosecution having been already heard, and the Magistrate having only adjourned the summons for the purpose of forming his own opinion after viewing the building.

The Magistrate, however, consented to hear counsel on the points of law involved.]

Mr. Redwar pointed out that in the definition of area as given in Section 3 the words "attached building," the height of which does not exceed the height of the ground-story, clearly point to smaller erections, such as sheds, being included in the category of buildings, and argued that, as in Section 51, which regulates the procedure for recovery of fees, the period from which fees in respect of buildings become due is the covering in of the roof. Any structure which can be entered and has a roof must be deemed to be a building. He further argued that if a shed be not a building a dangerous or noxious business might be carried on in a shed within the distances from other buildings prescribed by Statute 7 and 8 Vic., c. 84, sections 51-5; also that the provisions by Statute 14 Geo. III., c. 78, section 83, as to the application of insurance moneys in reinstating buildings destroyed or damaged by fire would become inoperative as regards sheds, which, he contended, from the wording of Section 86 of the latter Act, could not have been contemplated by the Legislature, as in that section it is enacted that no action shall lie against any person in whose house, chambers, stable, barn, or other building, a fire shall accidentally begin. The word "barn" occurring, he submitted that "other building" would include "shed" as being *ejusdem generis* as barn. Both the above Acts were incorporated in the Metropolitan Building Act, and must, therefore, be read with it. Moreover, if a shed be not a building it might be built of a greater height than the width of a street without the consent of the Metropolitan Board of Works, contrary to Section 85 of the Metropolis Management Amendment Act, 1862. He then referred to the case of Stephens *v.* Gourley, in which the Court held that the Metropolitan Building Act prohibited the erection of structures inclosed with walls constructed of combustible substances.

The Magistrate here said that what the defendant had erected was an extension of an existing structure: he had not erected a shed, so that the question whether the shed was a building did not really arise.

Mr. Redwar said that the original structure constituted a building, and that by Section 9 any alteration or addition to a building is to the extent of such alteration or addition subject to the rules of the Act. Now, by Section 38 notice is to be given by the builder to the District Surveyor, and by Section 39 the latter is required to cause the rules of the Act to be observed in the case of work of which no notice has been given. He referred to the case of Powell *v.* Farmer, in which a shed was held a building within the meaning of the Reform Act, 1832, in which, like the Building Act, there was no definition of a building; and also referred to the case of Watson *v.* Cotton, in which the Court expressed an opinion that a structure inclosed on two sides with masonry, and used for the stowage of goods, would be deemed to be a building, and he contended that as the extension in this case was inclosed on two sides with brick walls, it must be a building. If a shed was a building for the purpose of giving a vote, *à fortiori* it ought to be a building within the meaning of an Act designed to protect the public from danger of fire. Although the present summons was not for irregularity of construction, as a matter of fact the building as constructed was not in conformity with the Act. By Section 3, a party-wall is defined as a wall used or built in order to be used as a separation of any building from any other building, with a view to the same being occupied by different persons. Now, the wall which separated the sheds in question from the adjoining building was clearly a party-wall within this definition, and by Section 17 ought to be carried 1 ft. 3 in. above the roof of the highest building adjoining, which had not been done. He referred to the case of Knight *v.* Pursell, in which a wall separating sheds and closets on either side, in different occupations, was held to be a party-wall, and the structures to be buildings within the meaning of the Act; and submitted that the shed in the present case came within the principle of this decision, and, being a building, notice of the addition should have been given to the District Surveyor, whose duty it was to cause the rules of the Act to be observed. In conclusion, if this shed was not held to be a building it would be quite allowable to erect a shed in a similar position with a roof composed of wood and pitch, which would clearly be against the spirit of the Act.

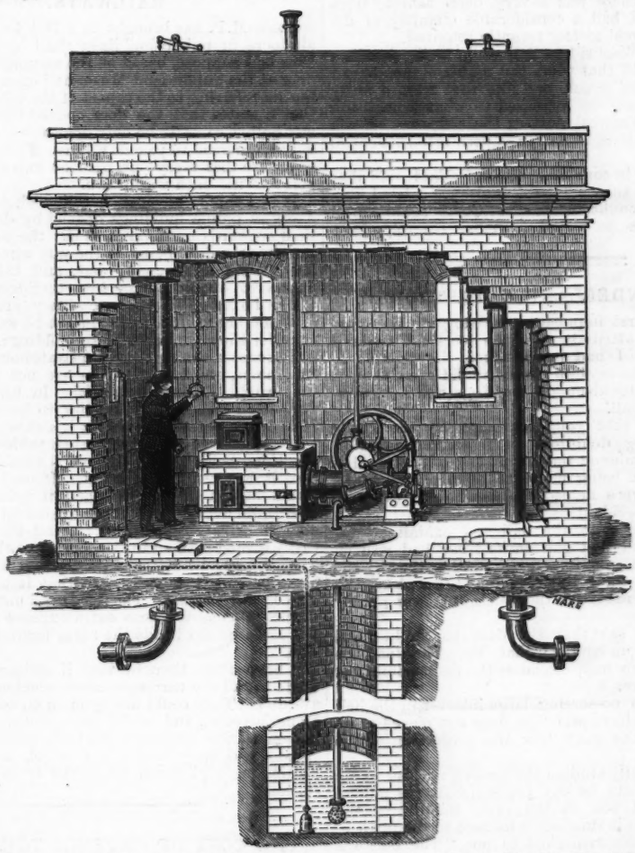
The Magistrate remarked that the roof of this shed was not composed of combustible materials.

Mr. Redwar said if the shed was a building the incombustible nature of the roof did not matter as the building in other respects did not conform to the Act.

The Magistrate said that he thought justice would be done by his availing himself of the discretion afforded him by the 16th Section of the Summary Jurisdiction Act, 1879, and he would accordingly inflict a nominal fine of 1s. on the defendant.

GOOLE SEWERAGE WORKS.

GOOLE is situated on the river Ouse. Considerable difficulties have been experienced in this flat district in obtaining a proper fall for the sewers. The engineer and surveyor to the Local Board (Mr. E. C. Buchanan Tudor, C.E.) has designed a flushing-tank, into which water is pumped for the purpose of cleansing the sewers as required at low water. The tank is 18 ft. in height above the discharge-pipe, and is capable of holding 5,000 gallons (or about 21 tons), which flushes two separate lines, one at a time, of 12 in. and 15 in. main sewer connected with a 4 ft. 6 in. by 3 ft. tank sewer fitted with penstock and tidal valves. It was intended, in the first instance, to flush from automatic tanks with water supplied by the water company, but as water costs 9d. per



1,000 gallons it was considered more economical, useful, and quite as efficient,—the sewers being tide-locked twice a day,—to get one of Bailey's hot-air engines, with simply a 3-in. pump, at a cost of 36*l.*, and to sink a well with Tudor's fire-clay well tubes and a bore-hole at a cost of 18*l.* There is an abundant supply of pure water. The total cost of the tank engine and building was about 135*l.* It will be seen from the illustration that the engine is fixed not far from the well, say 12 ft. The engine pumps 1,000 gallons per hour and fills the tank of 21 tons in five hours, as we are informed by Mr. Tudor, at a cost only of 3½d. for the day's work. The engine can, when not in use for pumping, be applied to other purposes with additional gearing, &c. The tank is filled as often as required, and is emptied into the sewers to be flushed in the river below low-water mark. The time taken to discharge the 21 tons of water through one discharge-pipe is 120 seconds. The engine gives satisfaction, and can be managed by a labouring man or boy.

City of London College.—The Prince of Wales has fixed Saturday next, the 7th of July, for the inauguration of the new building of the City of London College, White-street, Moorfields.

THE ROYAL COURTS OF JUSTICE.

CONTRACTORS' CLAIM FOR "RETENTION-MONEYS."

THE case of Lefeuvre and Another (Assignees of Bull) *v.* The Commissioners of Works and Public Buildings, came before the Queen's Bench Division on Tuesday last, Lord Coleridge, Mr. Justice Denman, and Mr. Justice Manisty on the bench. It was an action by the assignees of the contractors for the erection of the Royal Courts of Justice against the Commissioners of Works to recover the sum of 10,000*l.* alleged to be due and payable, and so clearly so as to justify a summary proceeding to recover it, provided under the Judicature Act, for the recovery of claims undoubtedly due and against which there can be no available defence. Such a proceeding had accordingly been taken, and the sole question at this stage of the case was not whether there is a valid defence to it, but whether the Commissioners ought to be allowed to defend.

The Attorney-General and the Hon. Alfred Hardy were for the Board of Works; Mr. Philbrick, Q.C., and Mr. Moulton were for the plaintiffs.

On the case being called on and its nature shortly stated by the plaintiffs' junior counsel,

The Court referred to and read the affidavits.

The plaintiffs' counsel pointed out that the claim was not for work done, but for "retention moneys," as they were called,—that is, moneys certificated due, but retained under the contract until its ultimate completion.

Lord Coleridge pointed out, however, that, upon Mr. Mitford's affidavit, it appeared that sums of money had already been paid to the contractors "largely in excess" of the sums due to them under the contract, and that sums were owing for penalties; so that it was insane, if that were so, to set up that sums were due for "retention moneys."

The plaintiffs' counsel urged that this was yet to be decided.

Lord Coleridge observed that this showed that there was a question to be decided, and, therefore, that the Commissioners should be let in to defend. It did not appear to be disputed that sums were due for "retention moneys," but counter-claims were set up, payments in excess, and also claims for penalties.

Mr. Moulton (for the plaintiffs) said the "final balance of account" was to be referred to arbitration. The sums paid were specific sums to be paid upon certificates. The present was in itself a separate and specific sum, due and payable now, leaving the "final balance" to be determined hereafter. There were enormous claims for extras which would have to be gone into on the general account. The present claim was for a specific sum now due. The other would be a claim on a general balance of the accounts, left to be determined on arbitration. As to the claim for penalties, there was nothing in it, as

it had never been set up before, and was not real or substantial. The affidavit of Mr. Mitford, the secretary, was, he submitted, entirely answered by the affidavit of Mr. Bull, the contractor, in reply. The sum claimed was now due and payable; the counterclaim was future and contingent, and afforded, therefore, no answer to the action.

Mr. Hardy said notice had been given of recourse to arbitration as to the general balance, and he pointed out that the contract provided for it.

Lord Coleridge said it was not necessary to hear counsel further for the Commissioners. It was clear there was a question to be decided and a defence to be raised, and therefore the Judge's order was quite right, and this appeal must be dismissed, with costs.

A DIRTY SLAUGHTER-HOUSE.

PUBLIC ABATTOIR WANTED.

AT the Coventry City Police Court, on June 21st, Mr. John Young, butcher, of Smithfield-street, was fined 20s. and costs for neglecting to have the manure, garbage, filth, &c., collected into proper tight-fitting tubs after the slaughtering, in accordance with the by-laws.

Mr. Frederick Booker, the sanitary inspector, in his evidence, stated that he had several times called the defendant's attention to this neglect, and to the offensive nuisance arising therefrom. He also said that on the defendant's premises, and adjoining the fasting-pen, there was a very deep ashpit, from which he had had a considerable quantity of decomposed animal matter recently removed.

Mr. H. N. Wackrill, of 2, Broadgate (the premises adjoining), said that when the nightsoil men began their work the stench was like that from a filthy pigsty, but later on increased to what seemed the smell of putrid animal matter; the sickening effluvia kept him up all night long, and permeated his entire house.

The Bench, in convicting the defendant, said that it was evident that a terrible nuisance existed, and if he was brought before the Court again on a similar charge he would be more severely dealt with.

THE SUNDERLAND CATASTROPHE.

SIR,—My first impulse on hearing of this catastrophe was to attribute it to the doors not opening outwards, for I had never taken the trouble to observe particularly how the doors did open, though I had frequently attended meetings and entertainments at the hall.

I observed that your contemporary the *Daily News*, yielding doubtless to a similar impulse, published a leader on the sin and enormity of public-hall doors not being made to open outwards, as though that were indeed the ascertained cause of this dreadful accident.

But, on going to the hall and examining for myself, I found that the *Daily News* had written by the inspiration of imagination rather than by the force of fact. On trying the door I was pleased to find it yielded readily to the touch, and swung freely outwards.

It has been said that the door had no business there, and I understand that Mr. Hoskins, the architect of the hall, disclaims the responsibility of placing it there.

A gentleman possessing large interest in the hall is reported to have said this door was placed there by the Hall Company "for the protection of the public."

I have carefully studied the matter, and fail to see how this door can be any protection to the public. Neither can I see, on the other hand, that the arrangement as it stands is a menace to the public.

One gentleman remarked to me, "The bolt was on the wrong side of the door"; and this impression or opinion prevails widely. But reflection must convince any person that this opinion is incorrect. Had the children liked, they could themselves in the first instance have lifted the bolt and pushed open the door and let themselves out, *had no one been standing outside or at the door to prevent them.* But had the bolt been on the outside of the door, instead of where it was, the children could not so readily have lifted it to liberate themselves.

The crush, instead of being one of children, might have been one of adults leaving the gallery, which is no doubt a frequent occurrence at this hall. If by mishap the door were left bolted ajar, as in the present case, the men next the door, being the first to feel the crush, would be able at once to raise the bolt and let themselves out.

I should not myself have placed the door where it is. I do not consider it in the best position to check a rush and assist in taking tickets or money (the object for which it was obviously intended). A better arrangement was practicable. But for all that, I think the present arrangement is not *per se* the origin or cause of the catastrophe, seeing that but for the presence of the man at the door the children could have lifted the bolt half an inch (that is all the hold it has in the floor), and let themselves out, had the door been by neglect bolted against them instead of being bolted back against the wall wide open, as it ought to have been, and (to judge by statements of witnesses) as it undoubtedly was, immediately before the exit of the children began.

Having formed my own conclusions about the fatal door, I then examined in a special manner the staircases and passages generally, and feel bound to say that, with the exception of a few doors opening the wrong way, which could be and ought to be remedied, I found the means of egress and ingress unusually ample and well provided; and I am sure few buildings have been better planned in this respect.

It is easy to swell the current of a popular cry, and denounce arrangements in themselves excellent. But it is not by so doing that such fatalities can be avoided.

One fault of the Victoria Hall is that it has never been finished; so that some arrangements for exit originally designed by the architect have not yet been carried out. But, notwithstanding this, the exits are so ample that few halls in that respect could claim such immunity from liability to accident.

The structural lesson taught by this disaster is a new one, viz., the danger of very long landings occurring on stairs. These give children and other impatient persons room to start a run or rush, which enormously increases the pressure on the stairs below, causing stumbling and crushing and wholesale death.

FRANK CAWS, Architect.

SLIDING DOORS FOR BUILDINGS AND RAILWAYS.

SOME M.P. has brought in a Bill to provide that all doors in public buildings shall open outwards. This is, I suppose, based on the assumption that the door at the Sunderland Music-hall opened inwards; but on referring to the report of the calamity, I find that it states that the door opened either way, but was bolted so as to be only opened wide enough for only one person to pass at a time. This was in order to ensure that every one paid on entrance, and the bolt had not been withdrawn.

It is, I think, an open question whether to have doors in public buildings opened by sliding, rather than outwards or inwards, is not the best plan. It prevents the door being in the way when the people are coming in or going out, and this especially applies to doors opening into corridors, like those of the boxes in a theatre. They are used very much on board ship, and it might be worth while to consider their applicability to buildings.

I have seen sliding-doors in private houses, between two rooms, and I wonder they are not more used; they would, I think, be useful. In bedrooms it is very often difficult to know how to hang the door. If it opens as from the wall it is awkward, and if it opens the other way it prevents a table or chair, or any thing being placed against the wall. In either case it is often inconvenient. If made to slide it would be out of the way, and if bolted into the floor could not be opened from the outside. In hotels, and in private houses also, we all know keys are easily turned without the sleeper's knowledge. Such a door could be left open a little if wished, as it could be bolted or wedged so that it could not be opened any farther. The door need not slide in the partition, so as to cause extra expense in building, but could be slid inside the room against the partition.

I have often thought that if sliding doors were made to railway carriages many accidents would be avoided. They could not fly open on account of not being fastened, and so let unsuspecting passengers out on to the line when the train was going at full speed, and they would not knock down people waiting on a platform when the train arrives at a station.

J. R.

THE COST OF GETTING YOUR OWN.

SIR,—It is devoutly to be wished that charges and expenses, as made in the annexed statement of the estate of one of our customers, who stopped payment, owing us a good sum of money, may be considerably modified by the new Bankruptcy Bill.

W. L.

In Bankruptcy.—Estate of E. B.

RECEIPTS.	£.	s.	d.
From Property	1,208	4	0
Debts	63	3	5
Takings	1	7	5
Rents, &c.	481	8	8
	£1,754	3	6

PAYMENTS.	£.	s.	d.
For Solicitors' bills	825	6	7
Messengers	20	1	0
Auctioneers	66	7	2
Surveyors	59	3	0
Creditors' assignee's expenses	30	9	1
Fees for the Chief Registrar account for services rendered by Official Assignee	14	15	7
Advertising dividends	0	10	0
Bonding proceedings	1	6	0
Wages, rent, taxes, rates, &c., payable in full	570	6	3
Petty expenses	4	17	11
First dividend of 8½d. in the £ on 4,370*l.* 6s. 2d.	161	0	11
	£1,754	3	6

MASTERS AND MEN.

Wrexham Lime-burners.—A strike at the Minerva Lime Company's works, about six miles from Wrexham, against a reduction of five per cent. in wages, has terminated, the men agreeing to return to work at the decrease.

Sunderland Engineers.—A meeting took place at Sunderland on the 20th inst. between master engineers and operatives, the latter claiming an advance of 2s. per week on the present rate of wages, and a limitation of the number of apprentices. Mr. John Burnett, the general secretary of the Amalgamated Engineers' Society, was present. The masters consented to give an advance, but refused the other demand. On the 21st inst. about 1,400 men came out on strike.

Tadcaster Masons.—The whole of the stonemasons recently employed on the new brewery in course of erection here by Mr. W. Smith have struck work for a small increase of wages, which the contractors refuse to give.

Jedburgh Masons.—The wages of the journeymen masons at Jedburgh were last week raised from 6d. to 6½d. per hour. One of the masters refused to give the rise at first, and his men went out on strike, but on the evening of the same day he came to their terms, and they resumed work next morning.

Greenock Engineers.—In reply to a demand by the operative engineers of Greenock and Port-Glasgow for an advance of ½d. per hour on their rate of wages, the employers have signified their intention to grant ½d. per hour increase, and the men have accepted the compromise.

PROVINCIAL NEWS.

Ovingham.—A bridge across the Tyne between Ovingham and Prudhoe has long been a pressing need, and on the 21st inst. the foundation-stone of a bridge was formally laid by Mrs. J. H. Ridley, of Welburn House. The bridge is being erected by a limited liability company, according to plans prepared by and under the supervision of Mr. H. Laws, M. Inst. C.E., Newcastle. It will be an iron lattice-girder bridge of eight spans, and its total length will be 530 ft. At the ends it will be supported by masonry abutments, while the piers in the river will be composed of wrought-iron piles. It will be wide enough for a single carriage, and have a passing way in the centre. It will stand 25 ft. above the bed of the river, and be constructed of a strength to resist the heavy floods which occasionally in the early spring sweep down the course of the stream. On the south, there will be an ascent to the bridge of 1 in 20. It will be necessary to cut 15 ft. through a mound on the other side, and then there will be an ascent of 1 in 12 to the road near the churchyard. Although the foundation-stone on the north side is only just laid, considerable progress has been made with the masonry on the south side. The ironwork is in course of manufacture, and will be delivered in a few days. With favourable weather, there is every prospect of the bridge being completed by September. The contractor for the masonry is Mr. W. Wilson, of Gilsland; and the contractors for the ironwork are the proprietors of the Alliance Works, Gateshead.

Burton-on-Trent.—On the 17th inst. the new hall which has been erected in Princess-street, for the services of the Town Mission Band, was opened by Mr. G. Norrish, of the Evangelical Society. Provision has been made, at a cost of between 400*l.* and 500*l.*, for nearly 500 people. As will be inferred from the cost, the building is a plain one, both externally and internally, but it is comfortably fitted. Land has been secured for the extension of the building when necessary. Mr. Loomes and Mr. Wheilden have carried out the work from designs by Mr. Woolley.

Crigglestone.—The new cemetery at Crigglestone, near Wakefield, has been consecrated. The buildings comprise two chapels, each having a vestry. The chapels are connected by an archway of half-timbered work, the gable of which is surmounted by a bell-turret. There is also a curator's house and board-room. The buildings are built of brick, with stone dressings, and the chapels are lined internally with light buff pressed bricks relieved with red brick strings. The architects are Messrs. Dixon & Moxon, Barnsley, and the work has been carried out, at a cost of about 2,000*l.*, by local contractors.

Derby.—The Derby Town Council are about to erect a new borough lunatic asylum. It is

intended to appropriate about fifty acres of the Rowditch Estate, and obtain about twenty-six acres of land in the vicinity. The estimated cost of the land, building, and furniture is, in round figures, 47,000*l*. The asylum is to accommodate 300 patients.

Holywell.—The work of clearing the *débris* of the old Upper Mill, belonging to the Welsh Flannel Manufacturing Company (Limited), which was destroyed by fire last February, has commenced, and will be pushed forward in order that the site may be obtained for the new mill which the company propose to erect. A meeting of the directors was held at Chester on the 16th inst., when tenders were received for the building of the mill, the plans of which have been prepared by Mr. Lockwood, of Chester. The work has been entrusted to Messrs. Thomas Hughes & Son, of Aldford, near Chester.

CHURCH-BUILDING NEWS.

Barrow (Cheshire).—Barrow Church, Cheshire, has been re-opened, after restoration. The principal structural work at the church has been the rebuilding of the south wall of the nave, and also the porch, necessitated, it is said, by the unsound state of the masonry in both cases, with the addition of a vestry and an organ-chamber, and the construction under the latter of a cell for the accommodation of a heating-apparatus. The whole building has also been re-roofed, and in place of the much-dilapidated slates with which the former roof-timbers were covered there have been used tiles of the warm and pleasant colour manufactured at Ruabon. Internally these roofs are "open-timbered," and have been substantially executed in oak. The roof of the chancel it was also found necessary to renew with the exception of the old and curious principal, whose state of preservation was such as to admit of its being refixed. The new work to this roof in the interior consists of its division into wooden panels by moulded ribs. As the nave of the church was but some twelve years ago reseated there is little to chronicle in the way of additions to this part of the structure after the roof has been mentioned. The floors under the existing seats have been removed, and have been laid in wooden blocks. The principal new work in the chancel consists of the seats for the choir and the prayer-desk, all carried out in oak, the latter having in its front tracered panels of an interesting and varied character. The floors of the chancel and sacrarium are laid with encaustic tiles, after an ancient design. The heating of the church has been secured by an arrangement of hot-water pipes on the high-pressure system, carried out by Messrs. H. King & Co., of Liverpool. The contract for the whole work was undertaken by Messrs. Reece Brothers, of Tarporley. The architect is Mr. John Douglas, of Chester.

Southport.—On the 23rd inst. the memorial-stone of a new church, now in course of erection at Crossens, a rapidly-increasing suburb of Southport, was laid by Mr. John Atkinson, J.P. The church is being erected from the designs of Mr. J. W. Connon, architect, Leeds, and will be of a simple type, suitable to its position in a quiet village. The style will be that prevailing in the early part of the fourteenth century, effect being sought by careful grouping rather than by elaborate ornament. The principal elevation will be the west one, facing the road from Southport. The centre of this front will be occupied by a group of two-light traceried windows, to be ultimately surmounted by a figure of St. John, placed under a canopy in the gable. On one side will be a porch and on the other a tower and spire rising to a considerable height. The sides of the building will be relieved by double-gabled transepts and vestries, and the east end will be apsidal, and will have a two-light window on each of the three faces. A pleasing contrast will be produced by the colour of the wall stones and stone dressings, the one being of light-coloured Bradford parpoints, and the other of red Runcorn stone. Internally, the church will consist of nave, with double transepts on each side, and a spacious chancel. The organ-chamber, on one side, will be lofty, and will be balanced by the choir and priests' vestries on the other. The roof will be partially open, and will be plastered between the main timbers. The chief effect internally will be produced by the arches of chancel, transepts, vestry, and organ-chamber, which will give the appearance of nave arcade. The contracts are let to Mr. John Schofield, of Dewsbury, for the sum of 2,500*l*. This is exclusive of the seating, heating, fencing, and general fitting of the edifice, so that the ultimate cost will probably be over 3,000*l*.

Walworth.—In consequence of the immensely increasing population on the site of the Surrey-gardens, the Rev. E. F. Alexander, vicar of St. Paul's, Lorrimore-square, Walworth, and chaplain to the Bishop of Rochester, with the aid of a committee, have determined to build a mission-room to accommodate 600 adults, at an estimated cost of 2,200*l*. At a meeting held on the 18th inst. Messrs. Romaine, Walker, & Tanner, of 19, Buckingham-street, Adelphi, were appointed architects.

Incorporated Church Building Society.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting, the last but one for the present session, on the 21st inst., Archdeacon Harrison in the chair. Grants of money were made in aid of the following objects: Building new churches at Hunslet St. Cuthbert, Yorkshire, 75*l*.; Stockton-on-Tees, St. Paul, 200*l*.; Trainglas, in the parish of Llywel, near Irecastle, Brecon, 80*l*.; and Tudhoe Grange, near Spennymoor, Durham, 200*l*. Rebuilding the churches at Marshwood St. Mary, near Crewkerne, Dorset, 40*l*.; and Southampton St. Mary, 200*l*. Enlarging or otherwise improving the accommodation in the churches at Churt St. John, near Farnham, Surrey, 25*l*.; Copford St. Michael, near Colchester, 50*l*.; Gosbeck St. Mary, near Needham Market, 30*l*.; Harlaston St. Matthew, near Tamworth, 60*l*.; Harpford St. Nicholas, near Ottery St. Mary, Devon, 40*l*.; Great Ilford St. Mary, Essex, 40*l*.; Ipswich, St. Mary at the Elms, 50*l*.; Littleham St. Margaret and St. Andrew, near Exmouth, Devon, 80*l*.; Marston St. Nicholas, near Oxford, 20*l*.; Plymouth, St. Saviour, 100*l*.; Wickhampton St. Andrew, near Acle, Norfolk, 40*l*.; and Great Yarmouth St. Andrew, 20*l*.

Sale.—St. Paul's new church, Sale, near Manchester, will be opened at the end of the present week. The structure will, in the first instance, be opened as a licensed church, the ceremony of consecration being deferred to a later period. The cost of erection up to the present will be about 7,000*l*., and 2,000*l*. more will be required to complete the work. The church will contain 700 sittings. Mr. H. R. Price is the architect.

DISSENTING CHURCH-BUILDING NEWS.

Chester.—A new Welsh Wesleyan Chapel is to be erected in Queen-street, to seat about 350 persons, at a total outlay of about 2,700*l*., including cost of site, &c. The architect is Mr. Richard Davies, Bangor, and Mr. G. Morris, builder, of King-street, is the contractor.

Bromsgrove.—The Wesleyan Chapel in Kidderminster-road having become very dilapidated and unsafe to use, and being incapable of repair, the question of providing another place of worship was raised, and Messrs. E. & W. Hunt, of Wednesbury, having contributed 1,000*l*. towards the cost of a new building, the site upon the New-road was secured, and on the 20th inst. the foundation stones were laid by Mrs. Allcock, Mr. E. Hunt, Miss A. Hunt, and Mr. J. J. Haines, and guinea and half-guinea memorial bricks were also laid. The new chapel has been designed by Mr. F. J. Yates, architect, Birmingham. Mr. Joseph Tilt is the builder, Mr. W. Griffin being employed to carry out the stonework. The chapel is to accommodate 450 persons. There will be a school-room and class-room to accommodate 300 children. The style is modern Gothic.

Burton-on-Trent.—On the 20th inst. the new chapel which has been erected by the Wesleyans in Byrkley-street to replace a smaller structure was opened for public worship. The foundation stones of the new building were laid in October last, and the building has been completed under the superintendence of the architect, Mr. C. F. Underhill. Accommodation is provided for 750 persons, and the chapel is seated with open benches of red deal lightly stained and varnished. The chapel is built of brick with Bath stone dressings. The contractor was Mr. H. C. Mellors, who sub-let the brickwork to Mr. G. W. Wildman and the stonework to Mr. D. Bassett. The tiles for the floors were supplied by Messrs. Mansfield & Whittaker, and the heating apparatus is by Truswell, of Sheffield. With the schoolroom, the opening of which was reported some time ago, the cost has amounted to 2,200*l*.

Books.

Hints to House-hunters and House-holders. By ERNEST TURNER. London: B. T. Batsford. 1883.

As the author of this little book says, of the making of innumerable books on the subject of sanitation there has been no end lately, and he does not intend this to be regarded as an attempt to swell the list, but only as a collection of memoranda or suggestions to persons who are already inhabiting houses or who are looking out for houses, as to what to look for and what to avoid. The first chapter goes through a brief statement of what is required in the various rooms in an ordinary dwelling-house. In the next chapter, upon the situation and aspect of a house, a great many very useful and some shrewd suggestions are brought together into a small compass; some of the suggestions dealing with special conditions peculiar to London. Among the more general suggestions is one that is often forgotten. "Should it be summer-time when you are viewing a proposed residence, try to realise what its appearance will be in the winter, and *vice versâ*." Many a disappointment might have been avoided by bearing in mind this very simple and natural consideration.

In treating of soil, the author puts clearly, and in a way to be easily remembered, the leading facts to be borne in mind in regard to the effect of various soils on the healthfulness of a building site, and does so in a way calculated to make the reader think, who has never thought before, as to the reason and meaning of this or that result of the conditions of a site. The chapter about drainage is a very useful one, and it is satisfactory to observe that the author is not the slave of all sanitary beliefs merely because they are the creed of advanced reformers; for instance, he ventures to say that a trap under a closet basin is at least an additional safeguard, and that the belief in the "trapless closet" is open to question. "So long as the water-supply and plunger which closes the outlet from the basin are in perfect working order these closets may be very good. But if by any accident the water be off, the air from the soil-pipe will enter the house through the overflow pipe, and when the plunger is raised. The ordinary valve-closet is also used without a trap under it. This is recommended by some who have given some attention to the subject, but my own experience is decidedly against it. In practice it is found that the advantage of a properly-constructed water-trap under a closet basin outweighs all the objections that can be raised to it"; and we agree with Mr. Turner there. It would have been as well if, in repeating the condemnation of the D and bell traps, the author had mentioned, for the benefit of general readers, the reasons for the special condemnation of those traps. We imagine that numbers of householders have taken up the cry against them who could not give a reason for it if they were asked. Service-pipes, Mr. Turner points out, are generally kept out of sight, "an excellent arrangement for the plumber, who is thus enabled to conceal any amount of scamped work." "No pipes above ground should be hidden behind anything but a *hinged* casing."

The chapters on warming and ventilation, which the author rightly considers in connexion with one another, are about the best in the book in substance, though somewhat unnecessarily wordy (in relation to the general dimensions of the book). The author adopts the principle that the chimney is the natural outlet ventilator, to be utilised as such in old houses, where alterations are difficult, by an opening directly into the flue from the upper part of the room (properly guarded by an Arnott or Boyle or some similar back-draught preventer), and in new houses by an opening into the ceiling, and thence to the chimney. For inlet, he stands by the entrance and warm-air chamber behind the fireplace; but this also can by no means always be done except when contrived from the first. In fact, it is scarcely possible to warm and ventilate any house in a really satisfactory manner, unless the scheme is planned and provided for in the first instance with the planning of the house.

The cautions in regard to house-choosing, and also the brief comprehensive statement as to the legal relations of landlord and tenant, in the final chapter, are very useful; the latter

pretty nearly bearing out the summing up of the subject which we heard once from a candid solicitor,—"The law is always on the side of landlords." A much-needed hint is given to the thoughtless purchaser against accepting mere general statements by the agent, such as that this or that "has been carefully seen to," and something else has been "thoroughly overhauled." The author's advice is, always insist on a specific statement as to *what* has been done, and if possible get it in writing. A very general statement as to the good condition of a house usually means, in reality, that the agent or vendor wishes to avoid details.

From a note prefixed to the advertisement pages, we learn that the author has exercised a personal supervision over the advertisements admitted, not allowing any which advertise things that are at variance with sanitary principles, or which have not something to recommend them. This is a precedent which might well be followed in books on practical subjects. Business is business in these matters, of course; but it seems rather absurd to find, in the advertisement sheets appended to a book intended to show the right way of doing something, proclamations entirely at variance with the recommendations in the bulk of the volume. The only special criticism we have to make on Mr. Turner's little book is that it is rather too much pervaded by a desire to be humorous and funny in the way of putting things. People do not need a book of this kind as a jest-book; and though this way of writing may seem piquant at first, it ends by being rather wearisome and out of place.

VARIORUM.

MESSRS. F. S. NICHOLS & Co. (Borough High-street), have published an etching by Mr. Percy Thomas, of the Old White Hart Inn-yard, Southwark, which is valuable as a memorial and satisfactory as a work of art. Few of our readers need to be reminded that this Inn dates back some five centuries. Mr. W. Rendle (no one is better suited) has contributed a fly-leaf of descriptive matter.——A third edition has been published of "The Standard of Value," by Wm. Leighton Jordan (London, David Bogue), 1883. It deserves consideration on the part of those who are interested in the subject. ——"Babies: How to Rear them in Health and Happiness," by F. A. Fawkes (W. Swan Sonnenschein, & Co., London) is a very valuable *brochure*, full of good advice. If this advice were enforced throughout the United Kingdom thousands of lives would be annually saved. Mr. Fawkes published a clever book on "Horticultural Buildings" some short time ago.—The July number of Mr. Walford's *Antiquarian Magazine* contains, *inter alia*, an article on a Cromwellian Museum at Hackney, the contents of which will be exhibited and lectured upon by the Rev. J. De Kewer Williams, in the course of July, at Houghton, near Huntingdon, not far from the birth-place of Oliver Cromwell.

Miscellanea.

The Ventilation of the District Railway. At the sitting, on the 22nd inst., of the Select Committee of the House of Commons appointed to inquire into the merits of the Bills promoted by the City Commissioners of Sewers and the Metropolitan Board of Works, which propose to abolish the District Railway ventilators. Mr. Hawksley, C.E., called as a witness on behalf of the Corporation, said that in his judgment there were other modes of ventilating the railway.—Cross-examined by Mr. Bidder, he said that amongst the alternative modes of ventilating the railway he would suggest that a tunnel should be constructed up Peter's-hill near Benet's-hill, to a vacant piece of land near Knightrider-street, where a shaft 100 ft. high could be erected to carry off the foul air, which would be warmed and driven out by means of a fan. This would give a velocity to the air in the tunnel of about 2 ft. per second. Other means of ventilating the railway have been suggested by subsequent witnesses.

New Clock at Langport.—A turret-clock has recently been fixed in Langport Town-hall by Mr. J. W. Benson. The time is shown on two dials, 4 ft. diameter on drum in the front of the building. The whole of the wheels are of hard brass. It strikes the hours on a bell of 2 cwt.

Fever by Despatch: Danger of Circulating Libraries.—An alarming piece of news comes from Paris. It is stated that an official at the Ministry of Foreign Affairs there has been attacked with yellow fever, communicated to him through a despatch from Brazil. This, if true, is a startling occurrence. We have repeatedly warned our readers against the danger of disseminating disease by means of books and toys. We believe circulating libraries are common sources of peril, and that many grave and even fatal illnesses may be traced to their agency. Books, especially of the "entertaining" class, are read by sick persons, either in bed when recovering from fevers and communicable diseases generally, or during convalescence, when perhaps some chest affection with a cough infects the atmosphere. It is, probably, impossible to guard against this, because the organic particles which carry the infection or contagion may lie for weeks, months, or perhaps years, between the pages of a bound book, to be dislodged at some unpropitious moment when the volume chances to be handled by a susceptible person. It would be difficult to imagine a more powerful apparatus for the conveyance of disease than a book. Among the maladies most easily communicable by this agency may be mentioned measles, scarlet fever, diphtheria, ordinary "sore" throat, whooping-cough, bronchitis (perhaps phthisis), and other chest affections in the course of which the lungs may be giving off poisonous breath and expectoration, and disorders in which the skin is the seat of abnormal changes, or may be throwing out infective material. In short, all that can be communicated is more likely to be communicated by a book than in almost any other way. It is obviously impracticable to disinfect books without injuring them, and the plain inference must be that circulating libraries are to be regarded as possible centres for the dissemination of disease, and that all books used by the sick should be destroyed immediately after use. Disease may be communicated by despatches, letters, or books. It is well that this should be more generally recognised.—*The Lancet.*

York Architectural Association.—On the 6th inst. a large number of the members of this society visited the Gas Works, Monk Bridge. They were met by Mr. Charles Sellers, who conducted the party over the works, and spoke at length on the history and the great questions of the day in reference to the manufacture and the consumption of gas, and he impressed upon the members the importance of providing efficient ventilation to gas-lighting in private houses and other enclosed situations. The retorts, purifiers, &c., were in due course visited and explained, and an inspection made of the new works. Mr. Walter G. Penty, president of the society, proposed a hearty vote of thanks to Mr. Sellers. Mr. William Brown, vice-president, seconded the motion, which was carried unanimously.

The Goldsmiths' Company.—The accounts of plate assayed and marked by the Goldsmiths' Company have, in accordance with the usual practice, been made up to May 28, and the result shows a very large increase in the work of the office for the year just ended. The number of ounces of silver plate assayed and marked by the company during the past year was 938,153 ounces against 893,880 ounces for the preceding year, showing an increase for the year of 44,273 ounces. The plate duty received by the company for the Government during the same period also shows a substantial increase, the figures being 46,889*l.* for the year 1882, against 46,233*l.* for the year 1881, and 42,995*l.* for the year 1880. The number of assays made by the company's officers during the past year was 79,227.—*City Press.*

The President of the Royal Institute of British Architects, and Mrs. Horace Jones, received the members of the Institute, and a large number of other guests, at a *conversazione* in the South Kensington Museum on Thursday evening last, by permission of the Lords of the Committee of Council on Education. Between 900 and 1,000 ladies and gentlemen were present. The arrangements were excellent. During the evening the band of the Grenadier Guards, under the direction of Mr. Dan Godfrey, performed a selection of music. As we were going to press at the time the gathering was drawing to a close we are unable to say more than that it was a large and brilliant assemblage.

Industrial Progress.—Sir Thomas Brassey, M.P., speaking on Saturday last, at the twenty-first annual meeting of the Working Men's Club and Institute Union, held in Westminster College Hall, said the interest of Parliament in regard to the social, moral, and material improvement of the masses of the people was undiminished. While it was admitted that sanitary matters ought properly to engage the attention of Parliament, yet too much ought not to be expected from the action of the State, for while the State could insure obedience to sanitary laws, it could not raise the standard of living of a nation. The total loans advanced under the Artisans and Labourers' Dwellings Improvement Act of 1857 could not be compared with the amount expended by the building societies of England and Wales. Between the returns of July, 1880, and those of May, 1881, the aggregate income of those societies had increased from 16,417,000*l.* to 18,694,000*l.*, and the aggregate assets from 31,864,000*l.* to 37,000,000*l.*, and those statistics represented a most gratifying amelioration in the homes of the people compared with which the exertions of the State must have produced an insignificant result. As regarded the condition of the working classes he said that, taking into view the rate of wages, the hours of work, the cost of living, and the general abundance of employment, the position of the British workman at the present time compared favourably with that of working people even in the United States. There was no reason to apprehend a reduction of wages in this country, and he would be sorry to see anything which could lead to a retrograde movement. On the contrary, he cherished the hope that the increase and the improved application of capital might admit of additions to the reward of labour, but, at the same time, it was his duty to point out that the industrial position of this country was threatened in many quarters by those who were formidable rivals in skill and energy.

University Honours to Archæologists.—At Oxford, during Commemoration week, the honorary degree of D.C.L. was conferred upon Dr. Schliemann, who met with a perfect ovation. Professor Bryce referred to Dr. Schliemann's early enthusiam for Homer and investigations into Homeric localities by excavation, characterising him "the first hero of spade and pickaxe." He also alluded to the Doctor's discoveries in the Troad, and to the discovery of the tombs at Mycenæ and their contents. ——At Cambridge "Commencement," honorary degrees were conferred upon Professor Emil Hübner, of Berlin (well known for his "Inscriptiones Britanniæ Latinæ"); Professor Adolf Michaelis (Professor of Classical Archæology in the University of Strasburg); Sir John Lubbock; and Mr. Reginald Stuart Poole, Keeper of Coins and Medals at the British Museum.

Proposed Bridge across the Humber.—After an inquiry, which has occupied nineteen days, a Select Committee of the House of Commons on the 22nd inst. threw out the Hull and Lincoln Railway Bill, which was a scheme for the construction of a direct railway from Hull to Lincoln by means of a high-level steel bridge across the Humber over a mile and a quarter in length. This bridge, had it been sanctioned, would have had a central span of 600 ft., which is the largest span of any existing bridge, not including either the Britannia or Menai bridges. The bridge would also have been greater in length than either of the proposed bridges across the Firth of Forth or the Firth of Tay. The rejection of the Bill was mainly due to the alleged hindrances which the bridge would cause to navigation.

The Somerset Drainage Commissioners. The tender of Mr. Richard Pickthall, of Birmingham, was accepted at the meeting of the Somerset Drainage Commissioners, held on Wednesday in last week at Bridgwater, for the reconstruction of the Baltmoor Wall, at a cost of 1,920*l.* Another tender, by Mr. Pickthall, was likewise accepted for the widening and deepening of a portion of the River Tone from Stanmoor Bridge upwards, the amount of the tender being 1,100*l.* The Commissioners also resolved that the Stanmoor Bridge should be reconstructed at a cost of 800*l.*, and that application be made to the Taunton Highway Board for the construction, a second sum of 100*l.* An order was made for the payment of 300*l.* for lands taken for the purpose of widening the River Parrett.

Honour to an Engineer.—At a meeting of the Senate of the University of Dublin on the 21st inst., the degree of *magisteria artis ingeniaria honoris causa* was conferred on Mr. Robert Crawford, A.M., Professor of Civil Engineering. The Senior Proctor, in referring to Mr. Crawford's career, said,—I now beg leave to bring forward the name of our Professor of Engineering, Mr. Robert Crawford. Mr. Crawford, I am happy to say, is one of our own men in every sense of the word, having received his education in arts as well as in engineering within these precincts. He obtained his degree of Bachelor of Engineering in 1851, and at his final examination was awarded special certificates in practical engineering and in chemistry and geology. After leaving our school he studied in Paris, in the Government School of Engineering and Mines. Since that time, and up to the period of his election to the Professorship of Engineering, he has practised his profession in all parts of the world,—in England, Canada, South America, and Germany. I shall not trouble you with details, but I can assure you that Mr. Crawford has carried out works of the greatest magnitude on both sides of the Atlantic, on the Grand Trunk Railway of Canada, the Buenos Ayres Great Southern Railway, the Central Uruguay Railway, the Empress Elizabeth Railway of Austria. Any of you who may travel from Frankfort-on-the-Maine to that delightful resort for health, Homburg, will please remember that you are running over Professor Crawford's work. There is no name better known than his in the Institution of Civil Engineers. I may add that the Institution awarded him the Telford Medal in 1863,—a very distinguished honour,—for his beautiful essay on the railway systems of Germany. We, in the college, feel happy in having such a man for our Professor.

A Nice State of Things.—At the meeting of the St. Saviour's (Southwark) District Board of Works, on the 20th inst., Dr. Bianchi (the medical officer of health) reported that he had seen Mr. Grant, at Spring-gardens, with reference to a serious nuisance caused by the escape of sewer gases in Southwark Bridge-road and Union-street. The nuisance had arisen thus:—A 6-ft. low-level sewer had been constructed in Southwark Bridge-road, and it was intended to carry it through the Mint into the Borough. But this intention had been frustrated by the South-Eastern Railway upsetting the Bill of the Metropolitan Board of Works in Parliament. Unfortunately the houses in Southwark Bridge-road had been connected with the sewer, which was now filled with sewage, for which there was no escape. As a matter of fact, the sewer was now a vast cesspool. The only remedy was to cut off the drainage connected with the sewer, re-connect the houses with the old high-level sewer, and pump out the sewage at present in the new sewer. This Mr. Grant was in process of completing. He (Dr. Bianchi) feared, however, that Union-street sewer would still prove a source of trouble, and to obviate this he would suggest that the Metropolitan Board be requested to erect a number of ventilating-shafts. On the motion of Mr. Hunt, the report was adopted. We quote this from a report in the *South London Press*. No doubt the railway company's powers have hindered the Metropolitan Board in making the new street; but surely this fact is no justification for allowing occupied houses in a thickly-populated district to be connected with an unfinished sewer.

National Association for the Promotion of Social Science.—A Conference on the Administration of Hospitals is to be held on Tuesday and Wednesday, July 3rd and 4th, 1883, at the House of the Society of Arts, John-street, Adelphi, London. The proceedings will be opened with a Statement by Mr. Francis S. Powell, a past President of the Health Department, describing the steps already taken by the Association, with a view to promote the appointment of a Royal Commission of Inquiry, for the purpose of obtaining reliable data upon which to base such reforms as may be necessary, and to make such recommendations as may appear desirable.

Rolled Iron Sections.—Messrs. Measures Bros. & Co., of Southwark-street, have issued a new sheet of sections, which will be found of great use. They have many more sections, longer lengths, &c., and, with their largely increased premises, are now in a position to execute orders for almost any quantity from stock. This saves time.

Hygiene of Armies in the Field.—At the Parkes Museum on the 21st inst. an instructive paper was read by Mr. Robert Rawlinson, C.B., on the "Hygiene of Armies in the Field." In it the author described some of his experience gained during the time he acted as the engineer member of a Sanitary Commission sent out to the army in the Crimea in the spring of 1855. The instructions issued to this committee directed them to investigate the condition of every hospital, infirmary, or receptacle for the sick, both as to interior ventilation and cleanliness and external surroundings, the Commission being empowered to obtain labour and other assistance for the carrying out of their recommendations. The Royal Commission, which, under the presidency of Lord Herbert of Lea, inquired into the sanitary state of the army after the Crimean War, resulted in Lord Herbert's Regulations, one of which provided that a sanitary officer should be attached to the quartermaster-general's staff; to this officer was committed the duty of examining into the sanitary condition of buildings selected for occupation by troops, and into the sanitary condition of towns or villages about to be occupied; he was also to make recommendations for organising a proper sanitary police to preserve cleanliness, and for the removal of nuisances. Where an army for a time becomes stationary, a sanitary corps will find ample work to do in improving roads, in surface-draining, in scavenging, and in ventilating any permanent buildings used as hospitals; and if the service will permit of a use of working parties, enormous benefits may be secured to the entire force in the field. In future wars it is admitted that picks and spades may require to be used as much, if not even more, than rifles. All officers will, therefore, have to learn something of engineering. If soldiers can use pick and spade to provide earthwork shelter from rifle bullets they may also use those implements for sanitary purposes.

Baron Tauchnitz.—Though we spoke in very strong terms of the good done by Baron Tauchnitz, in our short notice of M. Tolhausen's "Dictionnaire Technologique" (see p. 726, *ante*), we happened to speak of him at the same time as the bugbear of English authors, having some indistinct belief that he still at times made use of an English writer's works without sufficiently compensating him. All the good we said goes for nought with the excellent Baron, and he calls upon us to make clear to our readers that he never publishes piratically the works of English authors; but that, on the contrary, for forty years he has been in the most friendly relations with them, publishing their books in legitimate editions with copyright for the Continent, and paying them for such rights adequate sums. It gives us the greatest possible pleasure to set Baron Tauchnitz right with our readers.

The following Tenders were received by the Ilkeston Local Board, on Tuesday, for the carrying out of the sewage scheme:—

Lewis Russell, Ilkeston	£9,960	0	0
Hill Bros., High Wycombe	6,380	0	0
Killett & Bentley, London	6,282	0	0
S. & W. Pattinson, Ruskington, Lincolnshire	6,188	0	0
Dobb & Gummer, Rotherham	6,153	0	0
J. Palmer, Birmingham	5,998	0	0
C. Baker & Son, Barlborough, Chesterfield	5,950	0	0
John Jevons, Dudley	5,953	0	0
G. J. Raynor, Bootle, Liverpool	5,625	0	0
J. & G. Tomlinson, Derby	5,590	0	0
H. Lovett, Wolverhampton	5,400	0	0
T. Smart, Nottingham	5,323	0	0
J. Waterfield, Wirksworth	5,323	0	0
Beardsley & Pounder, Ilkeston	5,300	0	0
J. Hawley, Ilkeston	4,879	0	0
W. Cunliffe, Leigh, Lancashire	4,580	0	0
G. Smith, Newcastle-on-Tyne	3,942	0	0

The four lowest tenders were ordered to be submitted to the engineer for examination into the details, and report thereon.

Fire at a Concrete Factory.—On Saturday last a destructive fire occurred at Belvedere Wharf, Belvedere, Kent, upon the premises of Messrs. Lester & Co., patent concrete manufacturers. From an unknown cause a building of one floor, about 100 ft. by 50 ft., used as a store, became ignited. The fire spread to a second building of two floors, about 100 ft. by 50 ft., used as boiler and engine houses, manufactory, and store, and both were eventually destroyed.

The Committee of Christ Church, East Greenwich, have appointed Messrs. Romaine, Walker, & Tanner, of 19, Buckingham-street, Adelphi, architects to their new mission-room, accommodating 390 adults, about to be built in Farmdale-road, Westcombe Park.

TENDERS.

For rebuilding Nos. 30, 31, and 32, Fleet-street, and Nos. 1, 2, and 3, Falcon-court. Mr. T. E. Knightley, architect. Quantities by Messrs. Batterbury & Huxley:—

Mowlem & Co.	£11,083	0	0
Patman & Fotheringham	10,873	0	0
Conder	10,798	0	0
J. & J. Greenwood	10,674	0	0
Ashby Bros.	10,414	0	0
Chappell	10,348	0	0
C. Wall (accepted)	10,290	0	0

For erecting mission-house, S. George's-street, London Docks, for the Rev. C. H. Turner, M.A. Mr. Keith D. Young, architect. Quantities by Mr. Morgan Young:—

Lathey Bros.	£3,290	0	0
Hall, Beddall, & Co.	3,132	0	0
Dove Bros.	2,995	0	0
Hearle & Son	2,982	0	0
J. Grover	2,938	0	0
C. Cox (accepted)	2,880	0	0

For the erection of new residence in Southwood-lane, Highgate, for the Governors of the Cholmeley School. Mr. H. Winstanley, architect. Quantities by Mr. W. H. Brayshaw, architect:—

Southcott	£1,798	0	0
Patman & Fotheringham	1,773	0	0
Boyce	1,743	0	0
Larter	1,700	0	0
Roberts	1,667	0	0
McCormick & Sons (accepted)	1,569	0	0

For erection of a boot and shoe manufactory and stabling at High-street, Chesham, for Mr. Charles Long. Messrs. Higgs & Rudkin, 68, Lincoln's Inn-fields, architects. Quantities supplied:—

Rance & Gomm	£1,104	5	0
Wm. Boughton	905	0	0
Wm. Harding (accepted)	844	10	0

For erection of four shops and dwelling-houses at Kentish Town-road, for Major-General Eliot. Messrs. Higgs & Rudkin, 68, Lincoln's Inn-fields, architects. Quantities supplied:—

Jerrard	£2,674	0	0
Hooper	2,631	0	0
Evans	2,495	0	0
Gregar	2,268	0	0
Good Bros.	2,265	0	0
Allen & Sons (accepted)	2,200	0	0

For re-decorating the Hackney-road Wesleyan Chapel. Mr. William Nicoll, architect:—
J. Jarvis & Sons (accepted).

For restoring and re-decorating S. John's Vicarage, S. John's, Lewisham. Mr. G. M. Hills, architect:—
J. Jarvis & Sons (accepted) £291 10 0

For erection of cottage at Billington, for Mr. John Olney. Mr. Frederick Gotto, architect, Leighton Buzzard:—

J. Bird, Pilstone, Bucks	£375	0	0
W. Groom, Leighton Buzzard	346	13	0
T. P. Webb, Leighton Buzzard	325	0	0
G. Roberts, Leighton Buzzard	315	0	0
C. Hart, Leighton Buzzard	269	0	0
J. Tutt & Sons, Leighton Buzzard	269	0	0
G. Garside, Leighton Buzzard*	250	0	0

* Accepted.

For constructing road and sewers on the Honor Oak Estate, Forest Hill, for Mr. Edward Penny Trenchard. Mr. Herbert D. Appleton, surveyor:—

G. Felton, 4, Kilburn Bridge*	£1,464	0	0

* Accepted.

For repairs and decorations at the Dyers' Hall, for the Worshipful Company of Dyers. Mr. W. M. Waymouth, architect:—
W. Shurmur (accepted).

For two houses, High Barnet. Mr. W. Graves, architect:—

Ward & Lamble	£1,350	0	0
W. Shurmur	1,289	0	0
Richardson	1,251	0	0

For new schools at Betts-street, St. George's-in-the-East, for the School Board for London. Mr. E. R. Robson, architect:—
W. Shurmur (accepted) £9,990 0 0

For villa residence, Park-road, Hornsey. Mr. Farrar, architect:—

E. Lawrence	£1,335	0	0
Southgate	1,227	0	0
Kerry & Son	1,196	0	0
R. Conder	1,190	0	0
McCormick & Son	1,187	0	0
Ennor, Julian, & Co.	1,170	0	0
J. Smith & Son	1,133	0	0
W. Shurmur	1,125	0	0
Mattock Bros.	1,063	0	0

For erection of villa residences at Streatham. Mr. W. Smith, architect:—

J. Johnson	£1,245	0	0
Dunford & Langham	1,178	0	0
Steel Bros.	1,175	0	0
Stevens Bros.	1,165	0	0
Mattock Bros.	1,147	0	0
Lark & Son	1,088	0	0
W. Shurmur	1,086	0	0
J. Harper	1,026	0	0
Richardson	887	0	0

For additions, 15, Queen-square, Wycombe. Mr. A. Vernon, architect, 26, Great George-street, Westminster, and High Wycombe:—

Hunt	£635	0	0
Loosby	530	0	0
Nash	523	10	0
Gibson (accepted)	514	0	0

For improving the road in Gresty-lane, Crewe, leading to the abattoir and cattle market, for the Audlem Highway Board:—

G. H. Minney, Crewe	£152	10	6
Goodall, Wrenbury	145	0	0
Wm. Fitton, Cheerwell (accepted)	132	10	0
John Kellett, Hightown, Crewe	129	15	0

For carrying out additions and alterations to the Union Workhouse at Kidderminster. Quantities supplied by the architects. Messrs. Watkins & Scorer, St. Edmond's-chambers, Lincoln, architects:—

Horsman & Co., Wolverhampton ...	£16,000	0	0
Kellet & Bentley, London	15,900	0	0
Edmund Gabbutt, Liverpool	15,747	0	0
Dixon Bros., Worcester	15,716	0	0
John Garlick, Birmingham	15,555	0	0
H. Smith, Wolverley	15,400	0	0
C. A. Horton, Brierley-hill	15,198	0	0
Thos. Vale, Kidderminster	15,000	0	0
Vernon, Ewens, & Co., London.....	14,997	15	7
R. Thompson, Kidderminster.....	14,995	10	0
John Guest, Stourbridge	14,653	0	0
W. T. Bennett, Birmingham*	14,197	0	0

* Accepted.

For the erection of new Board schools, Connaught-road, Hove. Mr. Thomas Simpson, architect. Quantities by Messrs. George Lansdown & Harriss:—

J. Bruton, Brighton	£11,200	0	0
Scutt, Brighton	11,094	0	0
Dean, Brighton	10,480	0	0
Parson & Son, Hove	10,200	0	0
Barnes, Brighton	10,110	0	0
Peters, Horsham	10,100	0	0
Beard & Forster, East Grinstead ...	10,095	0	0
Stenning, Brighton	9,950	0	0
Bedford & Co., Horsham.....	9,930	0	0
Humphrey & Son, Hove	9,899	0	0
Morris, Ashurst Wood.....	9,875	0	0
Stimpson & C., London.....	9,760	0	0
W. & G. Davey, Brighton	9,743	0	0
W. Taylor, Brighton.....	9,741	0	0
J. T. Chappell, London and Hove...	9,680	0	0

For four houses at Hendon, for Mr. W. Crane. Messrs. J. Saville & Son, architects, 1, Argyle-square:—

Jackson & Todd.....	£1,680	0	0
Shurmur	1,649	0	0
Hearne	1,643	0	0
Killingback.....	1,635	0	0
Drew.....	1,635	0	0
Dixon	1,627	0	0
Lamble	1,612	0	0
Spencer & Co.	1,590	0	0
Stud Bros.	1,589	0	0
Smith	1,584	0	0
Royal	1,570	0	0
Martin	1,155	0	0
Jones	1,092	0	0

For the erection of the Boulevard Hotel, Radford Boulevard, Nottingham, for Mr. John Robinson. Mr. Herbert Walker, architect. Quantities by the architect:—

Greenwood.....	£4,020	0	0
Lynam & Kidd	3,829	0	0
Dennett & Ingle	3,758	0	0
Morrison.....	3,740	0	0
Bell & Son	3,688	0	0
Messom	3,677	0	0
Bains & Turton	3,600	0	0
Fisher Bros.	3,600	0	0
Vickers	3,595	0	0
Hopewell & Son.....	3,490	0	0
Wheatley & Maule	3,488	0	0
Scott (accepted)	3,430	0	0

For alterations and repairs to the Strand Union Offices, 6, Bow-street, for the Board of Guardians. Mr. C. J. Phipps, architect. Quantities by Mr. Tasker:—

Toms	£1,346	0	0
McLachlan.....	1,345	0	0
Wall.....	1,285	0	0
Patman & Fotheringham	1,135	0	0
Howard & Dorrell	1,081	0	0
Sykes	1,056	0	0
Wright	1,034	16	0
Macey.....	953	0	0

For works in alterations of premises in John-street, Bristol, for Mr. Albert Pole, printer. Mr. Herbert J. Jones, architect:—

				Allowed for Old Materials.		
Walters & Son	£935	0	0	.....	—	
Bastow	585	0	0	.....	£10	0 0
E. & T. Hatherly.....	537	0	0	.....	—	
Eastabrook & Son	486	0	0	.....	—	
Humphreys	450	0	0	.....	15	10 0
Saise & Son	410	0	0	.....	—	
Lewis & Edbrooke	425	0	0	.....	18	0 0
Green	401	10	0	.....	10	0 0

For new cowhouse, at the Leslie Park Dairy, Croydon, for the Metropolitan and Suburban Milk Supply Association (Limited). Mr. Hawkins, architect:—

Maides & Harper (accepted).....	£383	0	0

For making the Beeches-road, on the Beeches Estate, at West Bromwich, for Mr. G. B. Nichols, C.E.:—

Currall & Lewis.....	£2,550	0	0
Jones & Fitzmaurice	1,535	0	0
White	1,505	0	0
Hughes.....	1,464	0	0
Palmer.....	1,451	0	0

Accepted for new grain warehouse, Walmgate, York, for Messrs. Agar & Chadwick. Mr. W. Brown, architect. Quantities by the architect:—

G. Scaife (excavator and bricklayer).
J. Plows (mason).
H. Bowman (carpenter and joiner).
B. Baynes (slater).
J. Birch (plumber and glazier).
W. T. Walker (ironfounder).
W. Bellerby (painter).

For new schoolroom, Shrubbery-road, Lewisham, for Mr. John Roberts:—

Staines & Son (accepted) £617 0 0

For alterations to the Spread Eagle, Stockwell-street, for Mr. R. Salter. Mr. Jas. Buckland, architect:—

G. W. Sly (accepted).

For two hydraulic lifts at the Grand Hotel, Manchester. Messrs. Mills & Murgatroyd, architects:—

Clark, Bunnett, & Co. (Limited) (accepted).

For four hydraulic lifts at the North-Western Arcade, Birmingham. Mr. W. Jenkins, architect:—

Clark, Bunnett, & Co. (Limited) (accepted).

For removing present hydraulic lift and fixing one of Bunnett's patent hydraulic lifts, for the Governors of the Bank of England. Mr. A. W. Blomfield, architect:—

Clark, Bunnett, & Co. (Limited) (accepted).

For new buildings, Sayer-street, New Kent-road (2nd block), for Mr. G. R. Le Pays. Mr. C. Barnard, architect:—

J. H. Tarrant & Son (accepted).

TO CORRESPONDENTS.

J. T. P.—E. C. R.—F. M.—One who Knows.—A. P.—S. & A.—L. & H.—G. W.—F. B.—E. C.—W. O.—Wells & Co.—P.—M. & Co.—J. G.—S. F. C.—F. B. G.—S. W.—R. S. T.—W. S.—G. A.—G. W. S.—Great Eastern.—M. H. J.—W. & Co.—A. V.—W. S.—J. W.—W. W.—J. W. B.—D. B. (thanks).—M. N. G. (next week).—C. B. (send particulars).—A. S. (under our mark).

Correspondents should address the Editor, and *not* the Publisher, except in cases of business.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors

NOTICE TO SUBSCRIBERS.

THE INDEX and TITLE-PAGE for Volume XLIV. (January to June, 1883) will be given as a Supplement with the Number of July 14.

A [COLOURED TITLE-PAGE may be had, gratis, on personal application at the Office.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING-CASES (Cloth), with Strings, to hold a Month's Numbers price 2s. each.

THE FORTY-FOURTH VOLUME of "The Builder" (bound) will be ready shortly, price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE, AND GENERAL ADVERTISEMENTS,
Six lines (about fifty words) or under..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for Series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.
FOUR Lines (about THIRTY words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, Covent-garden, W.C. to

DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent

NOTICE TO ADVERTISERS.

Persons advertising in the *Builder* may have REPLIES ADDRESSED TO THE OFFICE 46, Catherine-street, Covent-garden, W.C., FREE OF CHARGE.

Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

Best Bath Stone.
WESTWOOD GROUND,
Box Ground, Combe Down,
Corsham Down,
And Farleigh Down.
RANDELL, SAUNDERS, & CO., Limited,
Corsham, Wilts. [ADVT.

Bath Stone.
Facilities for selection and quality unequalled, having upwards of
350,000 Feet Cube
In Stock of all known descriptions.
PICTOR & SONS, Box, Wilts. [Advt.

Doulting Freestone and Ham Hill Stone of best quality, in blocks, or prepared ready for fixing. An inspection of the Doulting Quarries is respectfully solicited; and Architects and others are CAUTIONED against inferior stone. Prices, delivered to any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset.—Agent, Mr. E. WILLIAMS, 73, Charlotte-street, Portland-place, W. [ADVT.

Doulting Freestone,
HAM HILL STONE,
BLUE LIAS LIME
(Ground or Lump),
Of best quality, supplied from their own Quarries and Kilns by STAPLE & HANN, Stoke, Ilminster.
Agent, Mr. H. MITCHELL, 5, Augustus-road, Hammersmith, London, W. [ADVT.

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [ADVT.

Immense quantities of
DRY WAINSCOT,
DRY MAHOGANY,
DRY WALNUT,
in all thicknesses.
B. J. HUDSON & SONS,
Whitfield-st., W., and Great Peter-st., S.W.
London. [ADVT.

MICHELMORE & REAP,
Manufacturers of
CHARLES COLLINGE'S PATENT.
COLLINGE'S PATENT HINGES,
LEVER, SCREW, & BARREL BOLTS,
Self-Acting "FALL DOWN" GATE STOPS,
and IMPROVED GATE FITTINGS of every Description.
36A, BOROUGH ROAD
DISCOUNT TO BUILDERS. LONDON, S.E.

ZINC ROOFING.
F. BRABY & CO.,
LONDON, LIVERPOOL, GLASGOW.
VIEILLE MONTAGNE BRAND.
NO SOLDER.
NO EXTERNAL FASTENINGS.
PARTICULARS ON APPLICATION. CHIEF OFFICE: 360, EUSTON ROAD, LONDON.